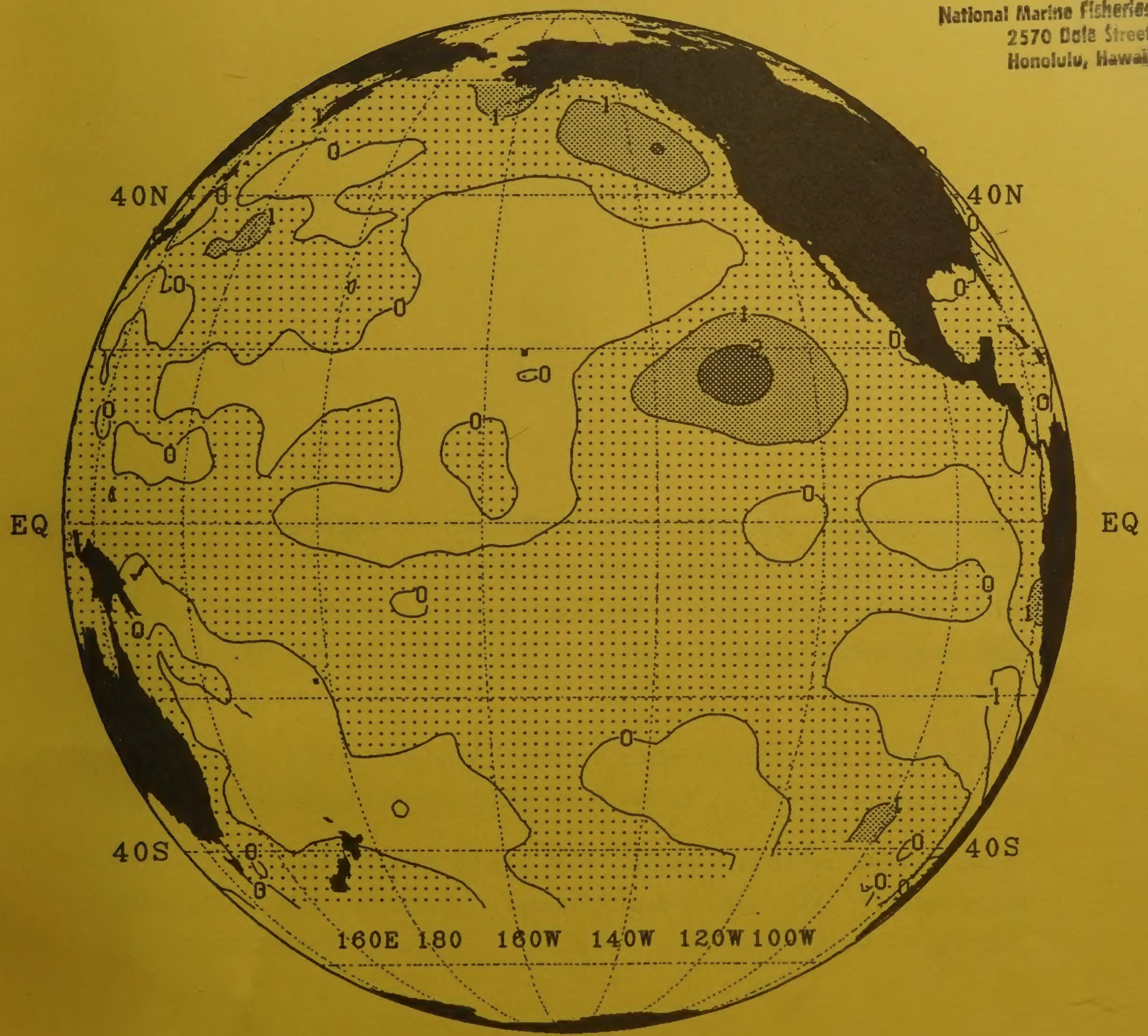
気 象 庁 海 洋 月 報

Monthly Ocean Report

February 1994 (No.14)



El Niño Monitoring Center
Japan Meteorological Agency

気象庁海洋気象部海洋課
エルニーニョ監視センター

平成6年2月

気象庁海洋月報は、気象庁海洋気象部海洋課エルニーニョ監視センターで
作成されています。本月報に関する問い合わせは、

〒100 東京都千代田区大手町 1-3-4 気象庁エルニーニョ監視センターまで。
電話 03-3212-8341(内線5134,5135)　　ファクシミリ 03-3211-3047

Monthly Ocean Report is prepared by the El Niño Monitoring Center(ENMC), Oceanographical Division, Marine Department, Japan Meteorological Agency.

Correspondence relating to this report may be directed to:

Kunio Sakurai, ENMC, JMA, 1-3-4 Ote-machi, Chiyoda-ku, Tokyo 100, Japan
OMNET:K.SAKURAI.JMA　　Facsimile +81-3-3211-3047

表紙は1994年2月の太平洋の月平均海面水温偏差図です。
陰影部は平年より高温の海域を示しています。

The figure on the front cover shows the monthly mean SST anomalies for February 1994 in the Pacific Ocean. Areas of positive anomalies are shaded.

目　次

Table of Contents

海況の特徴（1994年2月）

太平洋の海況

太平洋赤道域の海面水温は、正偏差と負偏差が交互に分布していたが、偏差の値はともに小さく、平年並だった。エルニーニョ監視海域（4°S～4°N,150°W～90°W）の海面水温偏差は、-0.1℃だった（第1表、第1図、第6図）。

中部赤道域の27℃の等温線の深度は前月より浅くなった。

北太平洋の海面水温は、30°Nに沿って、日本近海から170°Wにかけて平年より高かったが、170°Wから130°Wにかけては平年より低かった。カリフォルニア半島沖及びアラスカ湾沖では1℃以上平年より高い状態が続いていた（第1図）。

気象庁の海洋気象観測船「凌風丸」は、本年1月に日本近海から赤道域に至る137°Eに沿う海洋観測を実施した。このうち洋上大気中の二酸化炭素濃度の観測結果をⅲページに紹介する（図 A）。

日本近海の海況

日本近海の海面水温は、日本海西部及び北海道から関東、東海にかけての海域を除き、平年より0.5℃以上高かった（第17図）。

黒潮は、日本の南岸に沿って141°E付近までほぼ直進した後、上旬には房総半島に接岸して東に流れていたが、中旬からは房総半島沖を東に流れていた（第20図）。

本州東方の親潮系の冷水(深さ100mで5℃以下)の沿岸寄りの分枝は39.1°N・142.7°Eまで、沖合の分枝は39.8°N・146.7°Eまで、それぞれ達していた（第19図）。

熱帯の気象

太平洋の熱帯域において、対流圏下層では赤道付近で東風偏差となり、対流圏上層では赤道を挟んで低気圧性循環の対が現われ西風偏差となった。オーストラリア北部のモンスーンは1月から2月の前半まで不活発だったが、2月後半にはかなり活発となった。月平均海面気圧はタヒチ、ダーウィンとも平年並で南方振動指数（SOI）は+0.1だった（第1表、第12図、第13図）。

[気象庁長期予報課提供]

HIGHLIGHTS February 1994

Pacific

Sea surface temperatures (SSTs) were near normal throughout the equatorial Pacific. The SST index for region B (refer to Fig.6) was -0.1°C (Table 1 and Figs.1, 6).

The depth of the 27°C isotherm was shallower than the previous months in the central Pacific (Fig.9).

In the North Pacific Ocean, SSTs along 30°N were higher than normal from Japan to 170°W, and lower than normal from 170°W to 130°W. SSTs off Baja California and off the Gulf of Alaska continued to be 1°C above normal (Fig.1).

Features of the concentration of atmospheric carbon dioxide along the meridian of 137°E observed by R/V Ryofu Maru of JMA are introduced on Page iii.

Seas adjacent to Japan

SSTs in the seas adjacent to Japan were more than 0.5°C above normal except in the western part of the Japan Sea and from off Hokkaido to off Kanto and Tokai (Fig.17).

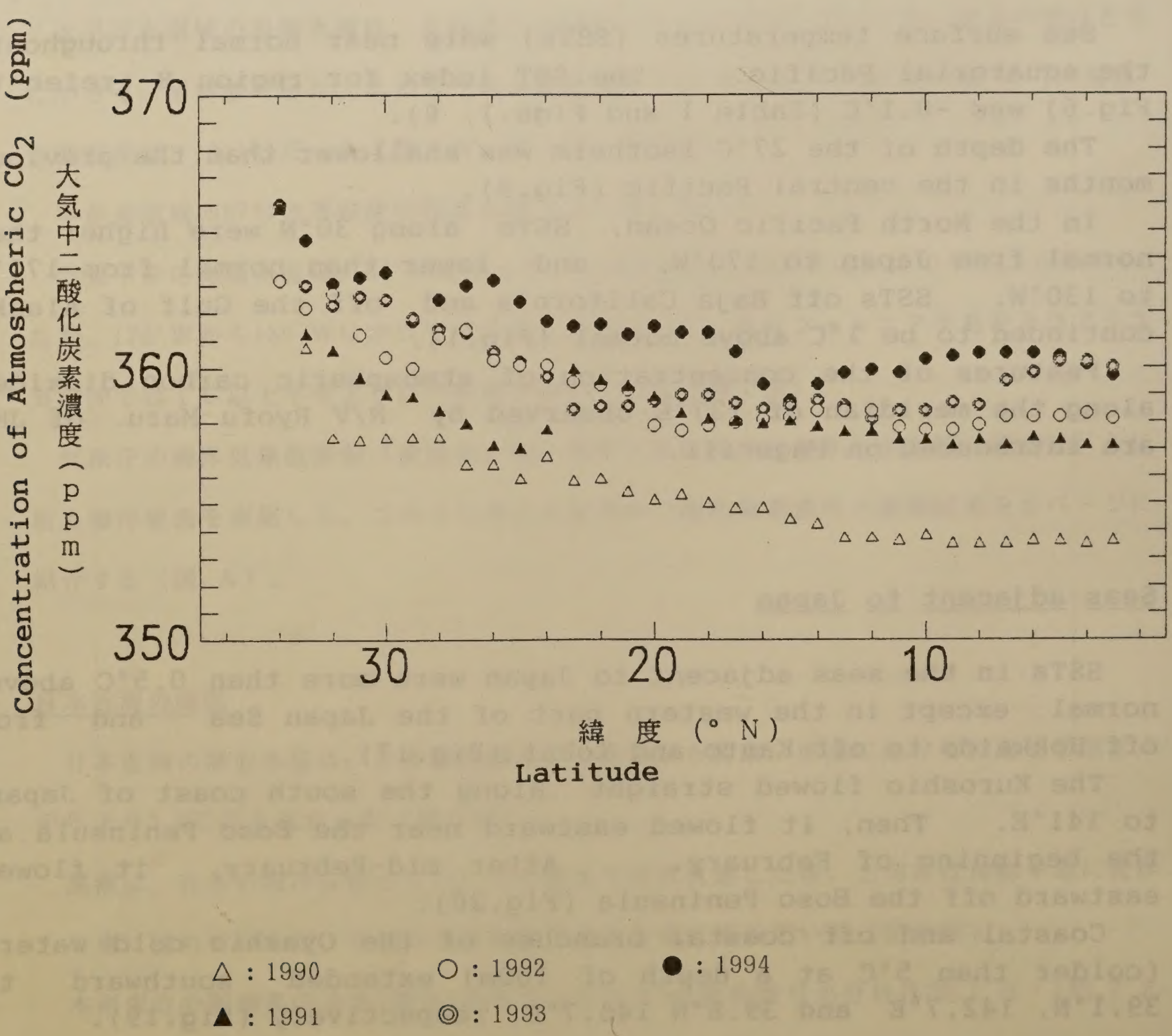
The Kuroshio flowed straight along the south coast of Japan to 141°E. Then, it flowed eastward near the Boso Peninsula at the beginning of February. After mid-February, it flowed eastward off the Boso Peninsula (Fig.20).

Coastal and off coastal branches of the Oyashio cold water (colder than 5°C at a depth of 100m) extended southward to 39.1°N, 142.7°E and 39.8°N 146.7°E, respectively (Fig.19).

Atmospheric conditions in the tropics

In the tropical Pacific, low-level easterly anomalies dominated. Consistent with this feature, in upper-level troposphere a pair of cyclonic circulations was located on either side of the equator and westerly anomalies were observed near the equator of the central Pacific. Australian monsoon has been active since the latter of this month. SOI was +0.1 (Table 1 and Figs.12, 13).

[prepared by the Long-range Forecast Division, JMA]



図A　137°Eに沿う洋上大気中の二酸化炭素濃度(ppm)。
(気象庁凌風丸による1990年から1994年の1月の観測結果)

Fig.A The concentration of atmospheric CO_2 along the meridian of 137°E observed by R/V Ryofu Maru of JMA in the five winters from 1990 through 1994.
The meridionally averaged concentration of CO_2 between 24°N and 3°N increased by 6.1ppm from 1990 to 1994. The rate of increase changes significantly from year to year in these years.
Further information is available at the Pollutants Chemical Analysis Center, Oceanographical Division, JMA.

Date		1992 SEP	OCT	NOV	DEC	1993 JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	1994 JAN	FEB
Pacific Sea Surface Temperature (℃)																			
D	(14N~ Eq.)	29.2	29.5	29.0	28.7	28.0	28.0	28.2	28.6	28.8	29.2	29.1	28.9	29.1	29.1	29.5	29.1	28.4	28.5
	(130E~150E)	0.0	+0.2	-0.2	-0.2	-0.5	-0.3	-0.2	-0.2	-0.3	-0.1	-0.1	-0.2	-0.1	-0.2	+0.3	+0.2	-0.1	+0.2
A	(4N~ 4S)	28.8	28.8	28.7	28.8	28.5	28.4	28.4	28.7	29.0	29.1	29.1	28.8	29.1	28.8	28.9	28.7	28.2	28.0
	(160E~150W)	+0.5	+0.4	+0.3	+0.6	+0.5	+0.4	+0.3	+0.5	+0.5	+0.6	+0.6	+0.4	+0.8	+0.4	+0.5	+0.5	+0.2	0.0
B	(4N~ 4S)	24.5	24.6	24.7	25.0	25.5	26.6	27.4	28.1	28.0	27.0	25.8	24.9	24.8	25.0	25.2	25.3	25.7	26.1
	(150W~ 90W)	-0.1	0.0	+0.1	+0.1	+0.1	+0.4	+0.5	+1.0	+1.4	+0.9	+0.6	+0.3	+0.2	+0.4	+0.6	+0.4	+0.3	-0.1
C	(Eq.~ 10S)	20.2	20.8	21.2	22.5	24.3	26.1	27.0	26.4	25.2	23.3	22.1	21.0	20.8	21.3	21.5	22.8	24.7	26.0
	(90W~ 80W)	-0.1	+0.1	-0.3	-0.1	0.0	+0.4	+1.1	+1.3	+1.3	+0.6	+0.5	+0.4	+0.5	+0.6	0.0	+0.2	+0.4	+0.3
Pacific Sea Level Anomaly (cm)																			
YAP	(10N,138E)	2	9	6	8	7	9	11	1	-2	-2	1	-1	5	8	8	10	7	
RABAUL	(4S,152E)	-10	-6	-6	-6	-9	-10	-14	-12	-13	-11	-8	-9	-7	-6	-5	-2	-1	
MAJURO	(7N,171E)	11	15	6	4	-1	-4	-4	-8	-1	6	5	3	1	5	2	3	2	
TARAWA	(1N,173E)	5	2	2	4	1	7	10	3	5	6	4	7	4	6	2	1	6	
CHRISTMAS	(2N,157W)	-4	-3	4	1	5	4	8	6	5	-1	-2	-1	-1	-2	-1	-7	-3	
SANTA CRUZ	(1S, 90W)	-3	-1	-1	-2	4	8	7	7	10	4	0	0	1	3	0	0	-1	

第１表 (a) エルニーニョ監視指数

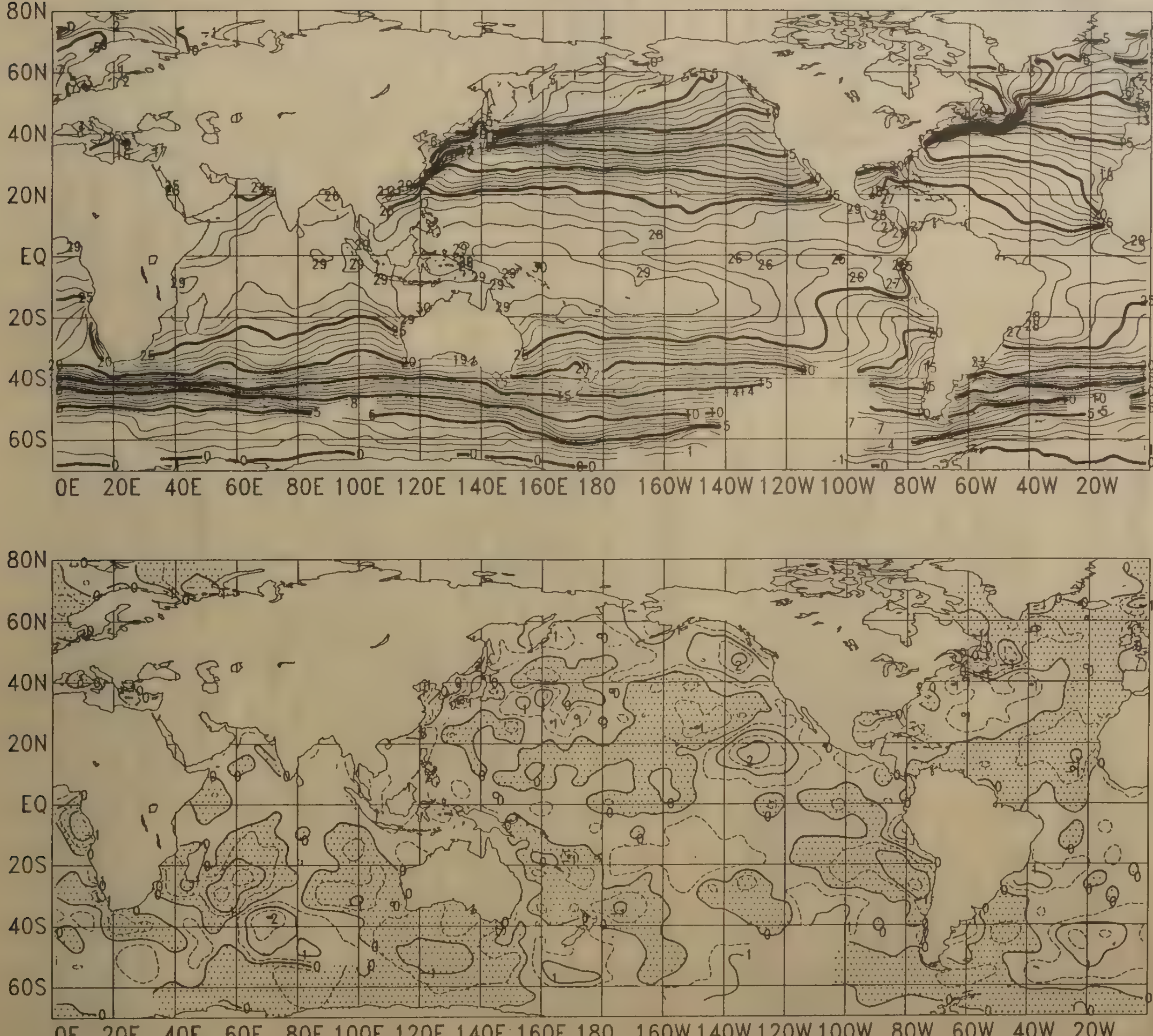
Table 1(a) El Niño monitoring indices. Data sources are the El Niño Monitoring Center, JMA for the sea surface temperature and the SOC of ISLP-PAC, Dept. of Oceanography, University of Hawaii for the sea level anomaly.

Date	1992 SEP	OCT	NOV	DEC	1993 JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	1994 JAN	FEB
Southern Oscillation Index (Unit of pressure anomalies at Tahiti and Darwin : hPa)																		
SOI (TAHITI-DARWIN)	-0.0	-2.0	-0.6	-0.5	-0.8	-0.6	-0.5	-1.9	-0.8	-1.6	-1.0	-1.5	-0.7	-1.4	-0.0	0.2	-0.2	0.1
TAHITI (17.5S , 150W)	-0.8	-2.3	-0.5	-1.1	-1.4	-1.9	1.0	-0.7	0.2	-0.6	-1.1	0.0	-0.0	-0.9	0.1	-0.0	-0.1	0.0
DARWIN (12.5S , 131E)	-0.8	0.5	0.6	-0.2	0.4	-0.3	2.4	1.9	1.4	1.3	0.4	2.2	1.4	1.3	0.1	-0.5	0.3	-0.2
High Cloud Amount Index																		
HCLD-PH (20N ~ 10N) (110E ~ 140E)	-1.6	0.9	-1.7	-1.4	-1.0	-0.3	-0.4	-0.5	-2.2	-1.9	-0.5	-0.4	0.7	-0.1	-0.6	1.2	-0.5	-0.5
HCLD-MC (5N ~ 5S) (110E ~ 135E)	-0.4	0.6	-0.8	0.4	-1.1	-0.9	-1.1	0.3	-1.4	-2.1	-1.0	-1.4	-1.0	-1.5	-0.8	-0.2	-0.4	-0.5
HCLD-DL (5N ~ 5S) (170E ~ 170W)	-0.6	-0.1	1.3	1.2	0.8	1.4	0.5	2.8	2.0	1.8	1.3	0.3	1.8	1.7	-0.2	0.0	0.0	-0.7
Equatorial Zonal Wind Index																		
U200-IN (5N ~ 5S) (80E ~ 100E)	-1.1	-1.4	0.1	0.1	-0.1	0.8	-0.9	-0.3	0.5	0.4	-0.3	-0.5	-2.1	-0.7	-0.8	-1.8	-0.4	-0.8
U200-CP (5N ~ 5S) (180 ~ 125W)	-0.4	0.7	-0.2	0.7	-0.3	-0.3	0.0	-0.6	-1.3	-0.0	1.1	0.3	-0.3	0.0	-0.5	0.4	0.4	0.8
U850-WP (5N ~ 5S) (160E ~ 175W)	0.2	0.2	0.4	0.8	0.3	0.9	0.3	0.8	0.5	0.3	0.1	0.7	-0.0	0.9	-0.4	-0.7	-1.2	-1.0
U850-CP (5N ~ 5S) (170W ~ 135W)	0.5	-0.4	0.9	0.2	0.2	0.0	-0.1	0.3	0.6	0.6	-0.8	0.1	0.2	0.4	0.3	-0.5	-0.6	-0.9
U850-EP (5N ~ 5S) (130W ~ 100W)	0.6	-1.2	1.9	-0.0	0.1	-0.1	0.2	0.5	0.9	0.7	-0.4	0.8	1.0	0.2	0.9	0.2	0.1	-0.4

第１表 (b) エルニーニョ監視指数(続き)

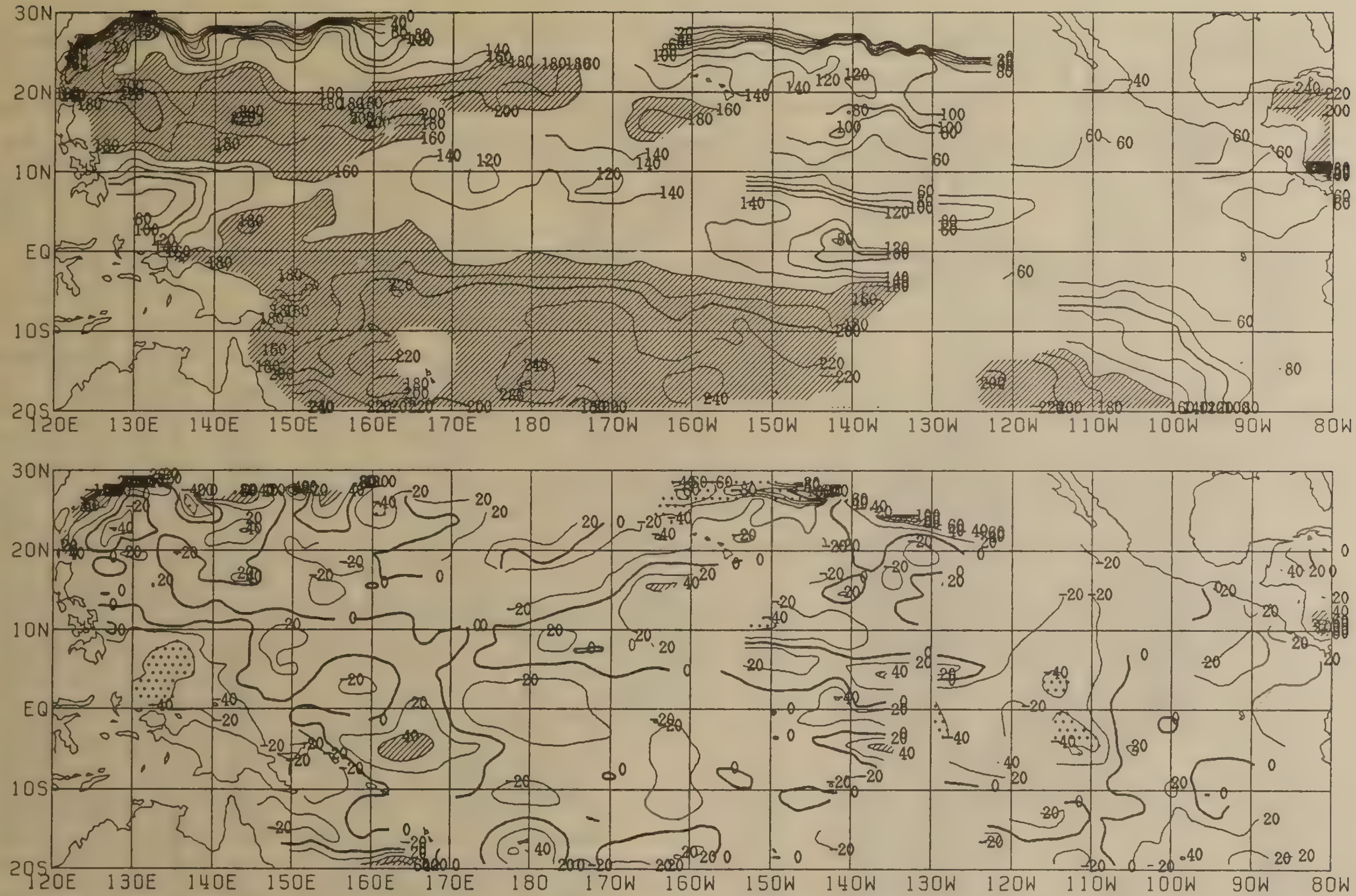
Table 1(b) El Niño monitoring indices (continued) .

Data source for these atmospheric conditions is the Long-range Forecast Division, JMA.



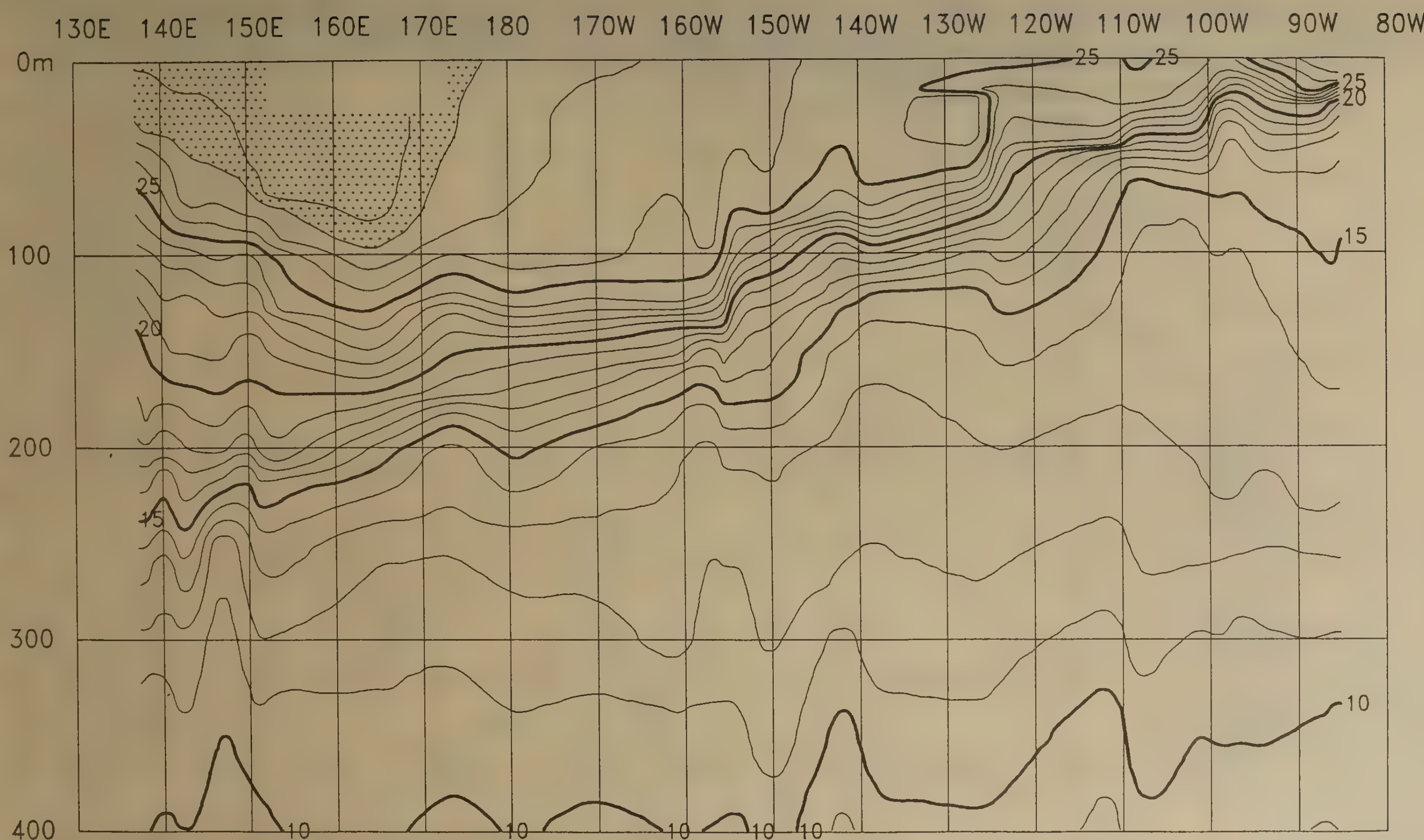
第1図　全球月平均海面水温図（上）及び偏差図（下）（1994年 2月）

Fig.1　Monthly mean sea surface temperature in the global ocean (top) and anomalies (bottom) for FEB 1994.　Anomalies are computed with respect to the JMA climatology (1961−90) (Climatic charts of sea surface temperatures of the western North Pacific and the global ocean, March 1991).　The Contour interval is 1°C and additional anomaly contours of ±0.5°C are shown as broken lines.　Negative anomalies are stippled.



第２図　太平洋表層水温（20℃深度）図（上）及び偏差図（下）（1994年 2月）
Fig.2 The depth of a 20° C isotherm in the Pacific Ocean (top) and anomalies (bottom) for FEB 1994. Anomalies are computed with respect to the climatology (Levitus, 1982, Climatological Atlas of the World Ocean, NOAA).
The contour interval is 20m with shading for values greater than 160m (top), and shading/stippling for values greater/smaller than +40m/−40m (bottom).

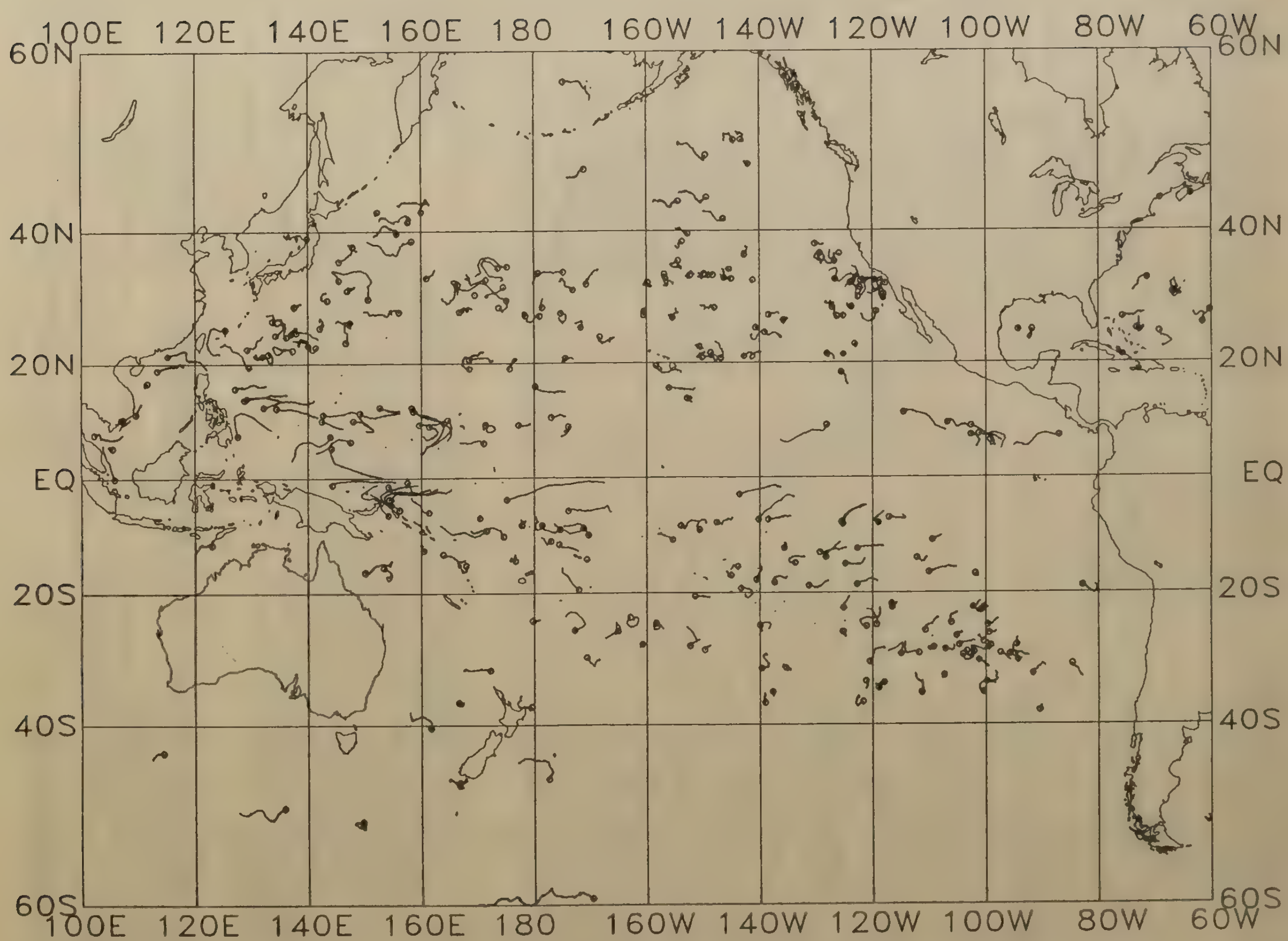
Depth–Longitude Section of Ocean Temperature



第３図　太平洋赤道に沿う表層水温断面図（1994年 2月）

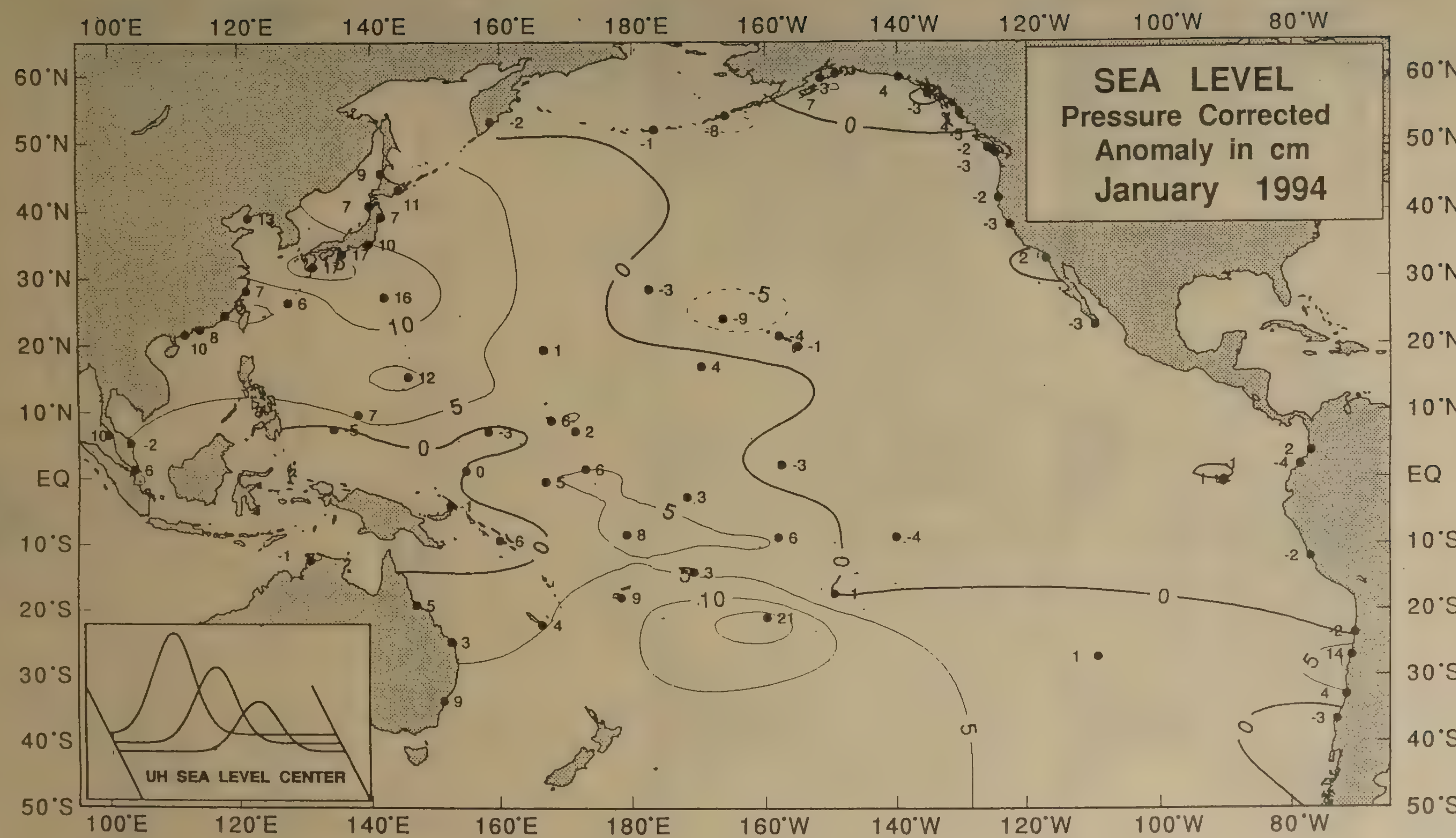
Fig.3 Depth–longitude section of the Pacific Ocean temperature along the equator for FEB 1994. The contour interval is 1°C with spotted shading for values greater than 28°C.

Movements of Drifting Buoys



第4図　太平洋ブイ流跡図(1994年 2月)

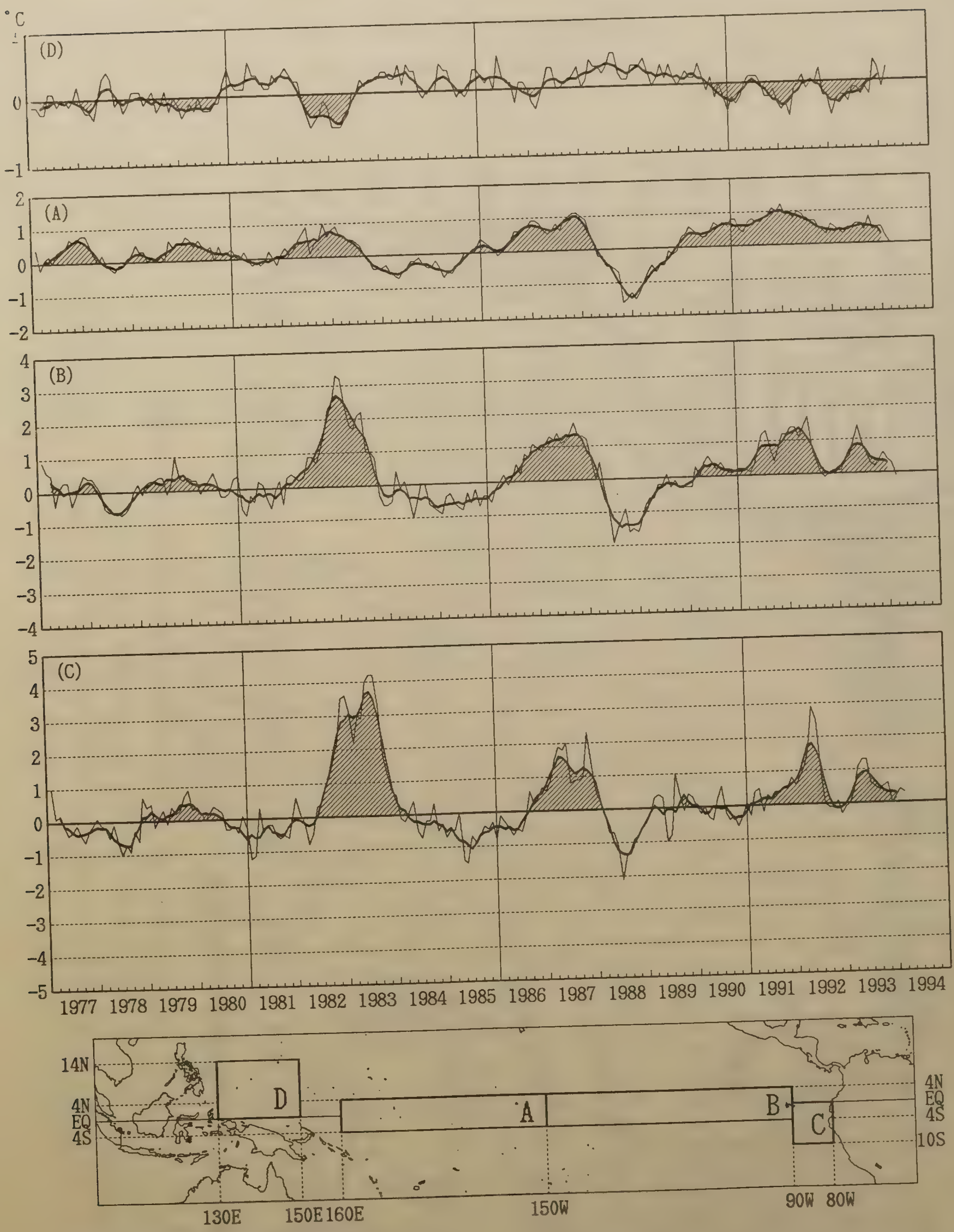
Fig.4 Movements of drifting buoys in the Pacific Ocean during FEB 1994. Each track is one buoy, with the small circle representing the buoy's last position for the month.



第5図　太平洋海面水位偏差図（ 1994年 1月 ）

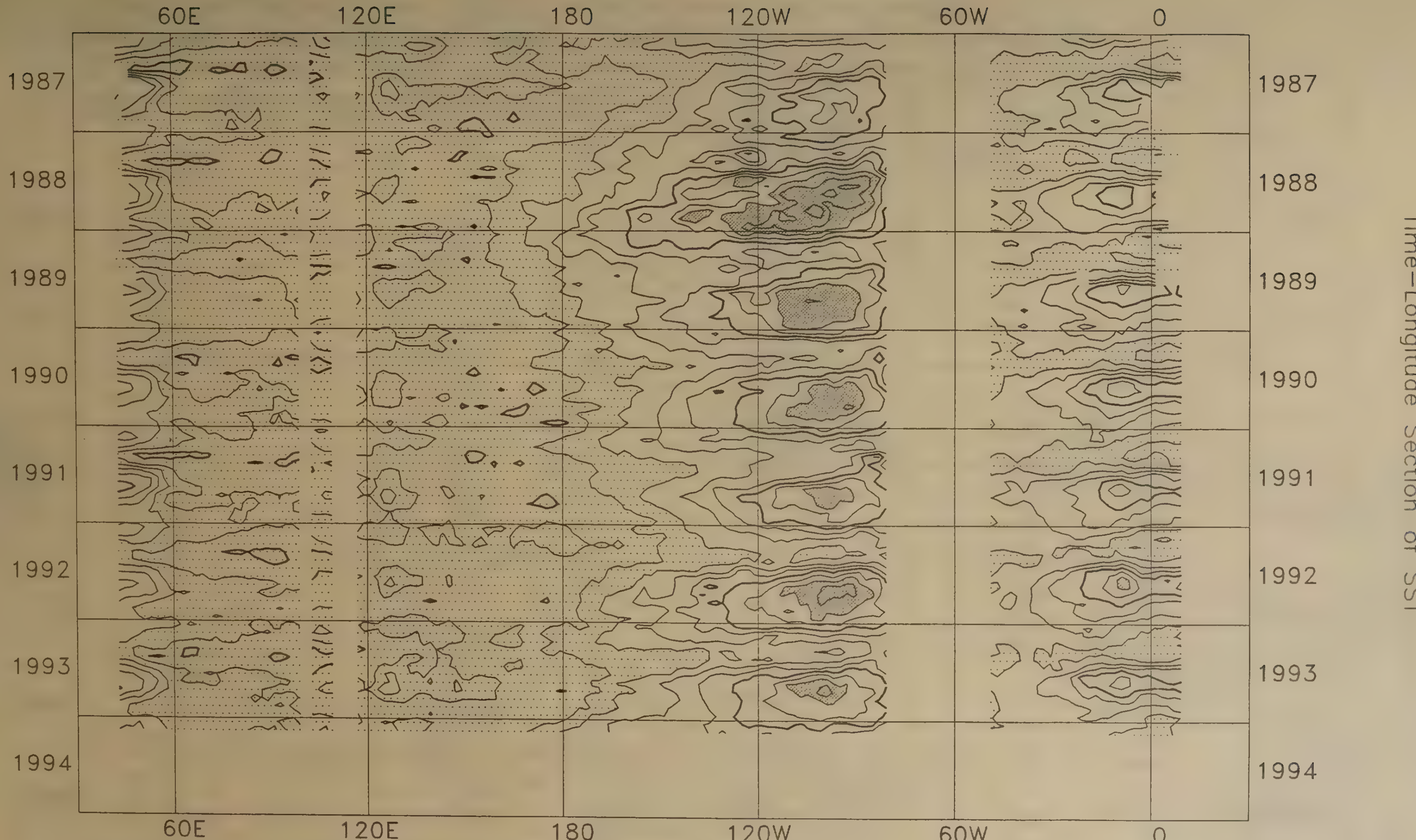
Fig.5 Sea level anomalies obtained from the 1975 to 1986 mean JAN sea level adjusted for atmospheric pressure (JAN 1994).
This figure is prepared by the SOC of ISLP–PAC, Dept. of Oceanography, Univ. of Hawaii.

Time Series of Equatorial Pacific SST Anomalies



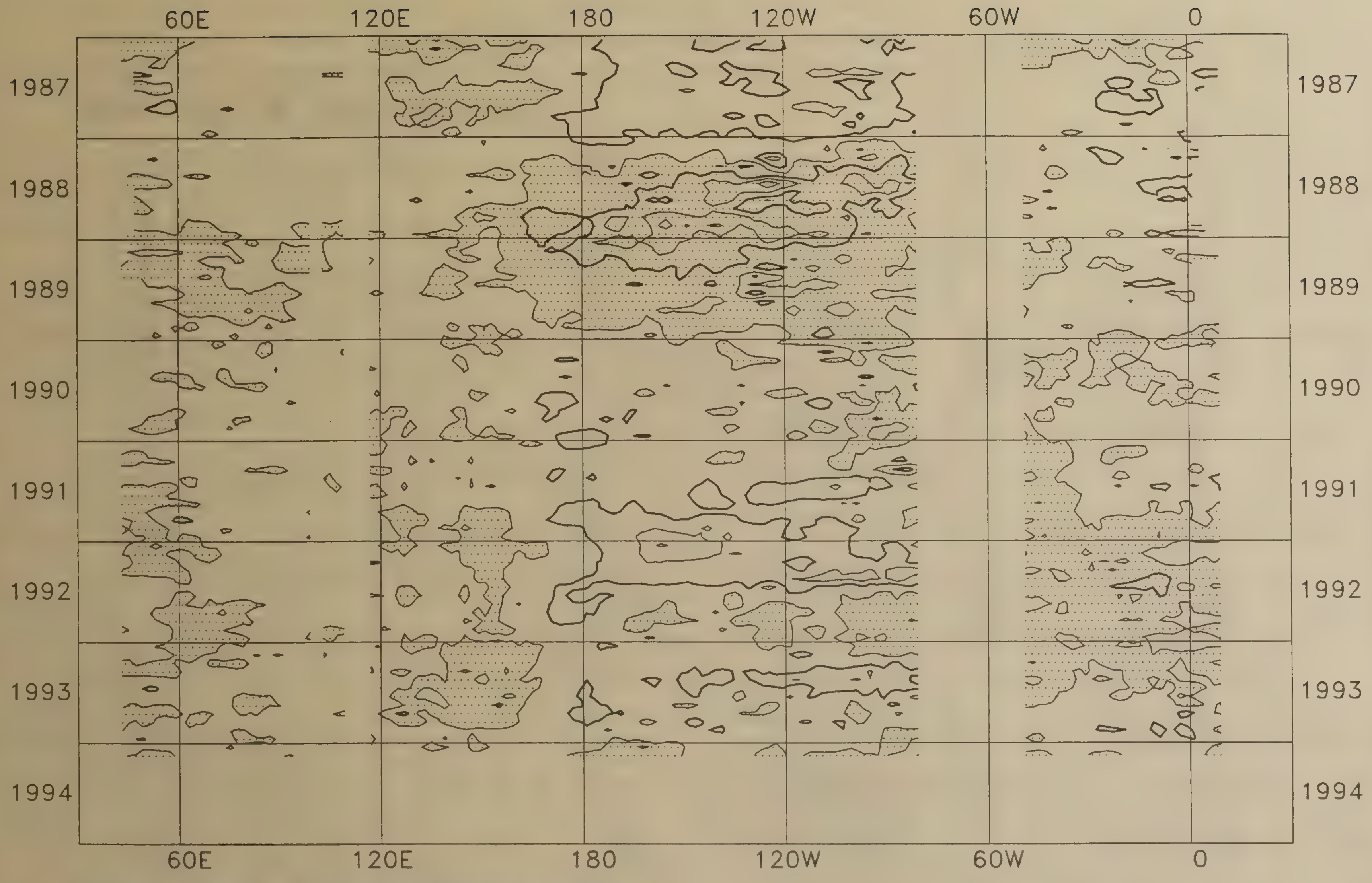
第6図　赤道太平洋海面水温偏差時系列図

Fig.6 Time series of monthly mean SST anomalies in the equotorial Pacific Ocean for the areas indicated at the bottom of the figure. Thin lines show the monthly values and thick lines their 5 month running mean. Positve anomalies (A,B,C) and negative anomalies (D) are shaded. Anomalies are computed with respect to the JMA climatology (1961–90).



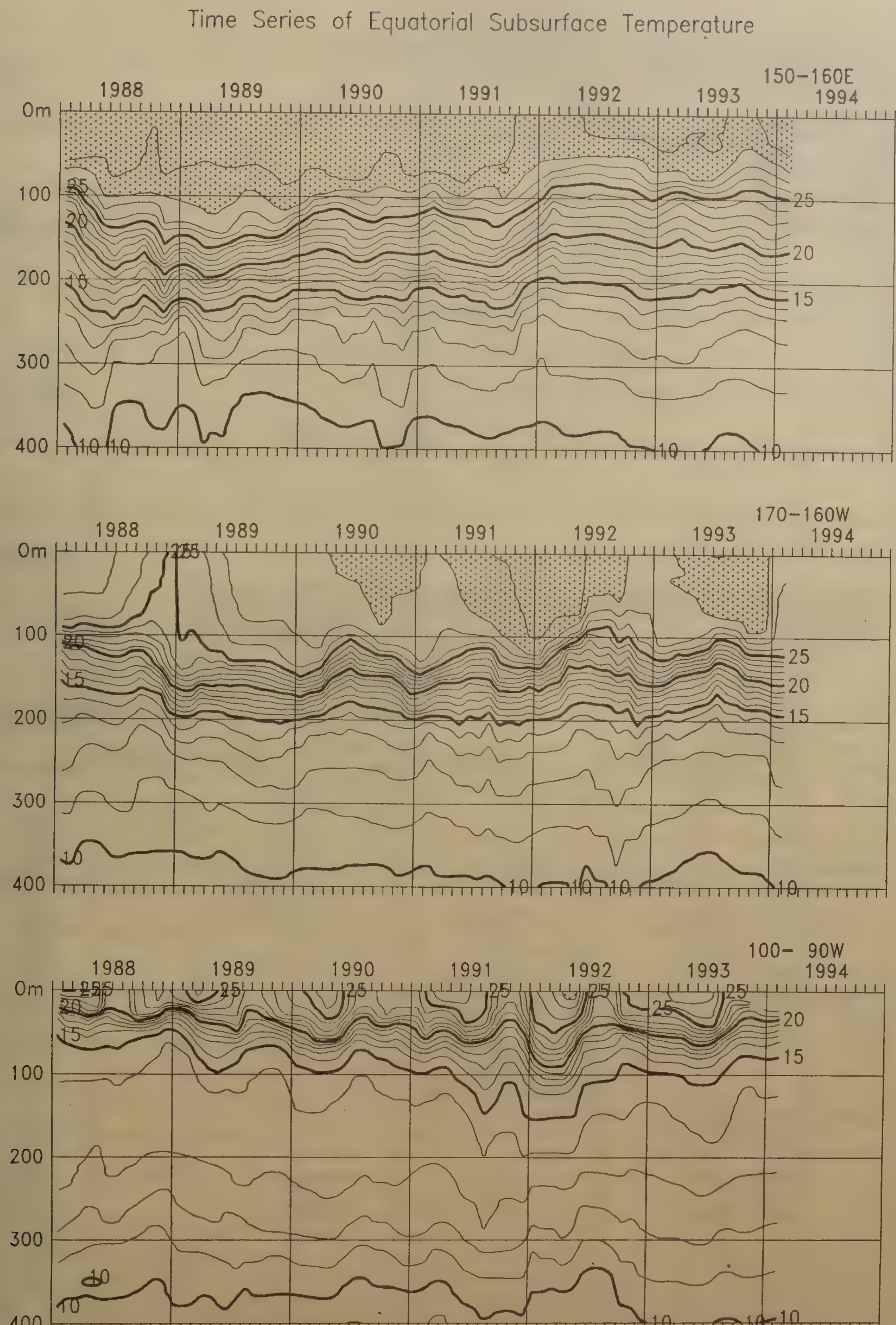
第7図　赤道に沿う海面水温時系列図

Fig.7 Time−longitude section of SSTs along the equator (2° N−2° S) in the global ocean. The contour interval is 1° C, with thick contour lines at 25 and 30° C. SST values greater than 28° C are spotted and values less than 23° C are shaded.



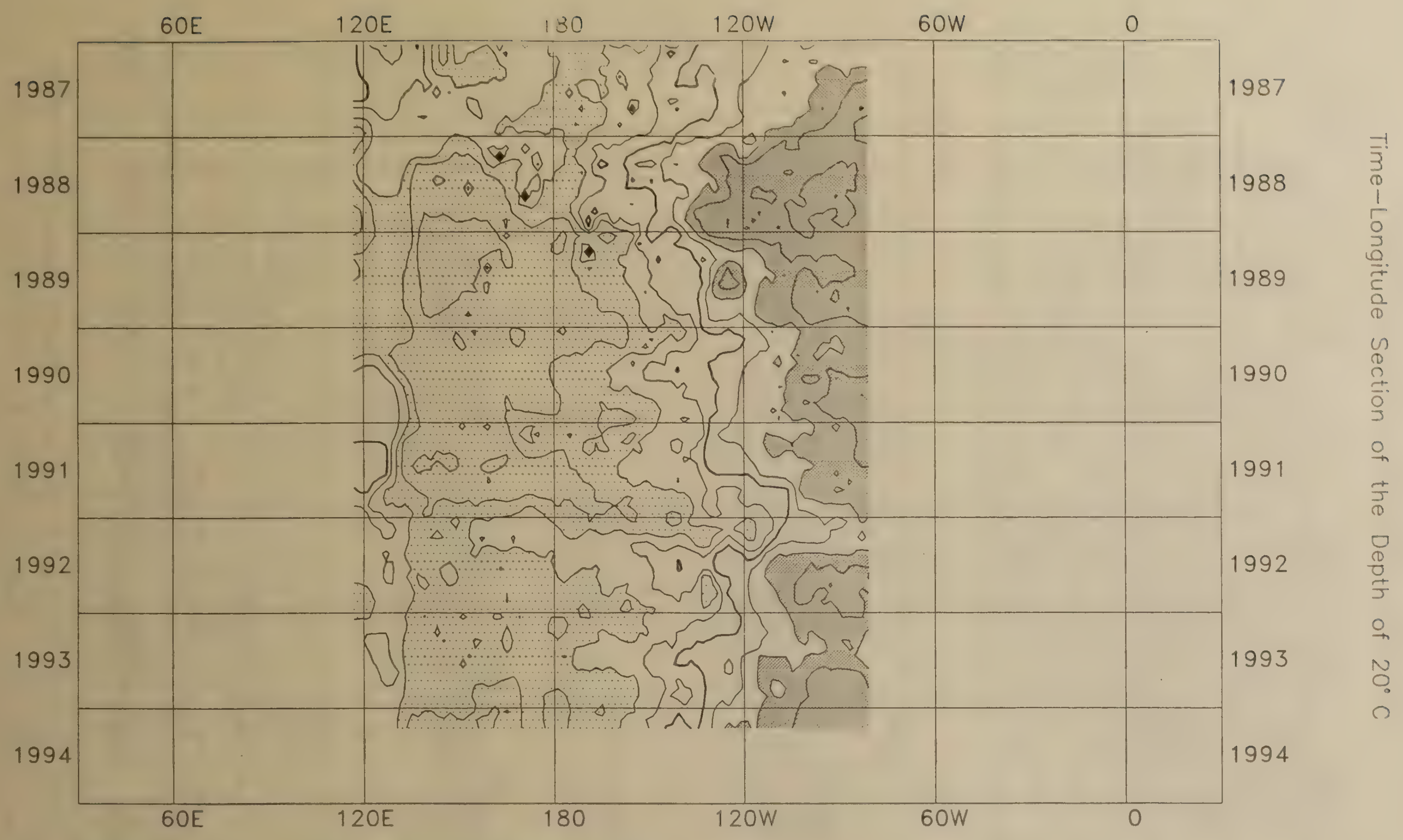
第8図　赤道に沿う海面水温偏差時系列図

Fig.8 Time-longitude section of SST anomalies along the equator (2° N–2° S) based on the JMA climatology (1961–1990). The contour interval is 1° C, with thick contour lines at +1° C and −1° C. Negative anomalies are spotted.



第９図　赤道太平洋表層水温時系列図（上：西部、中：中部、下：東部）

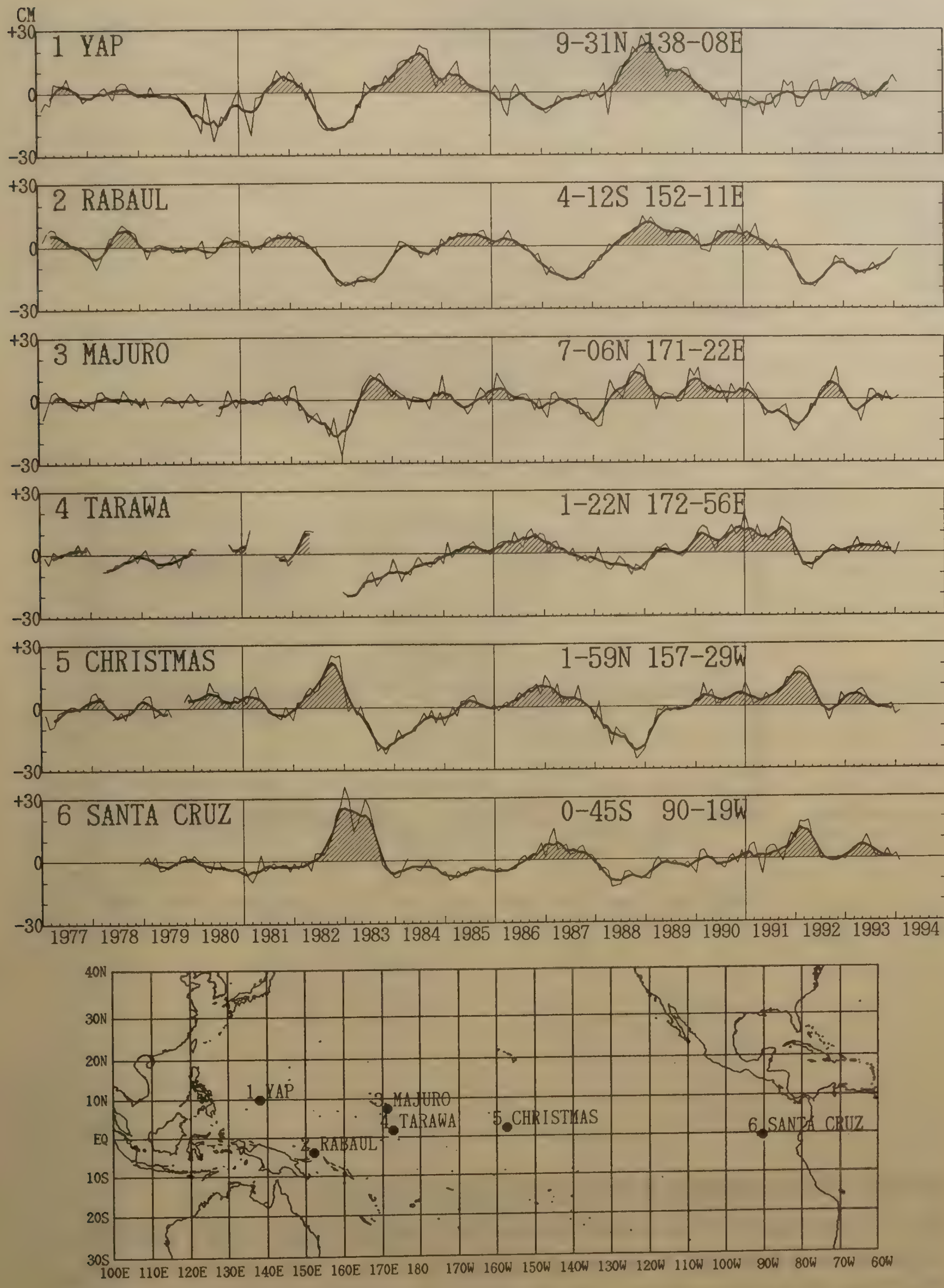
Fig.9 Time series of equatorial (2° N–2° S) subsurface temperature for the western Pacific (top, 150–160° E), the central Pacific (middle, 170–160° W) and the eastern Pacific (bottom, 100–90° W). The contour interval is 1° C with spotted shading for the values greater than 28° C.



第10図　太平洋の赤道に沿う20℃深度時系列図

Fig.10 Time-longitude section of the depth of a 20° C isotherm along the equator in the Pacific Ocean. The contour interval is 20m with thick contour lines at 100m. Values shallower than 60m are shaded and those deeper than 140m are stippled.

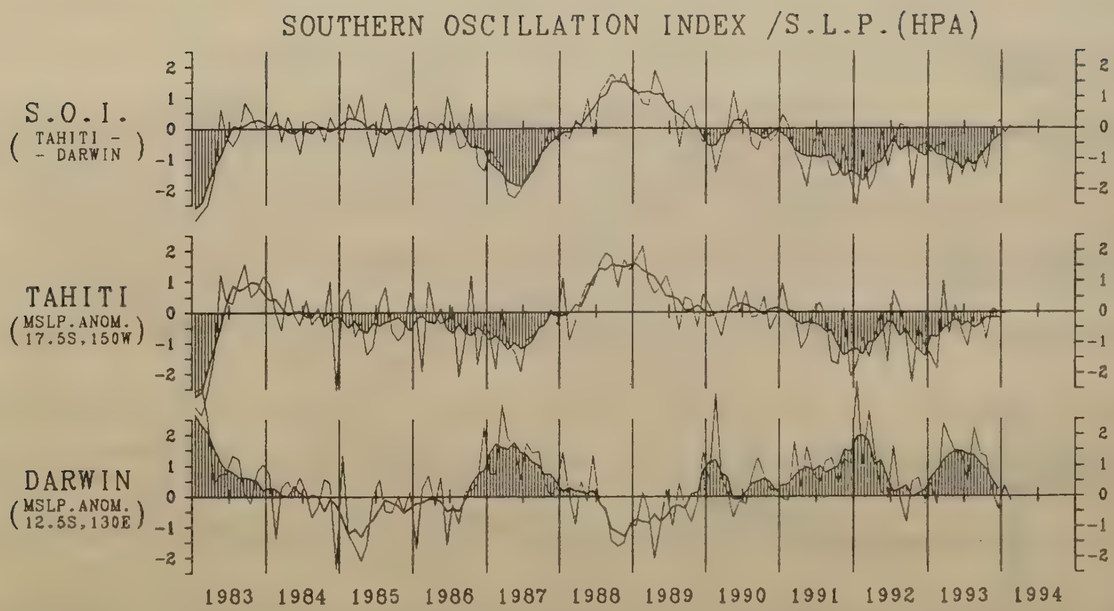
Time series of Sea Level Anomalies



第11図　太平洋月平均海面水位偏差時系列図

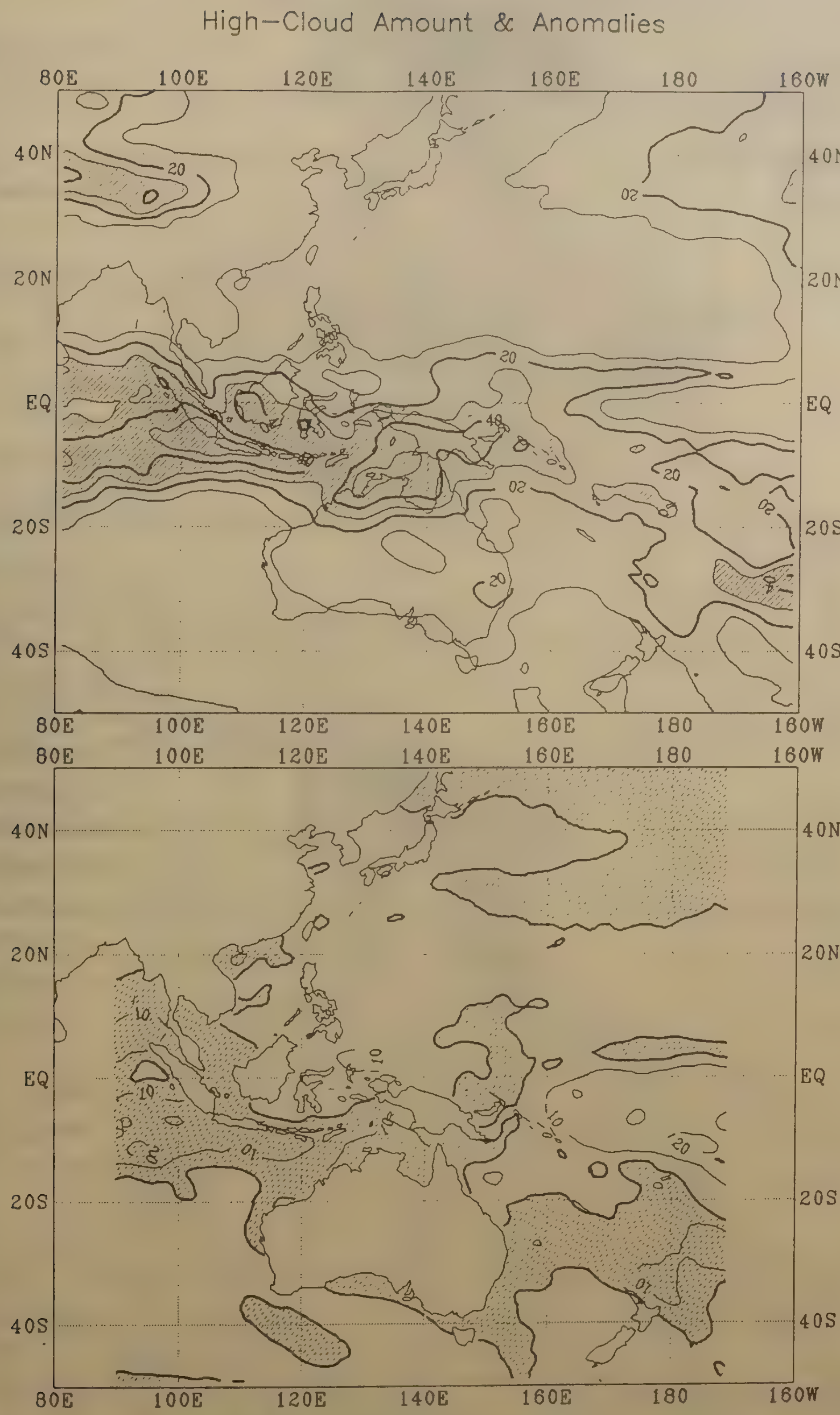
Fig.11 Time series of sea level anomalies based on 1976 to 1990 monthly mean sea level obtained from the stations indicated at the bottom of the figure. Thin lines show the monthly mean and thick lines show their 5 month running mean. Positive anomalies are shaded.

Time series of SOI & Sea Level Pressure Standardized Anomalies



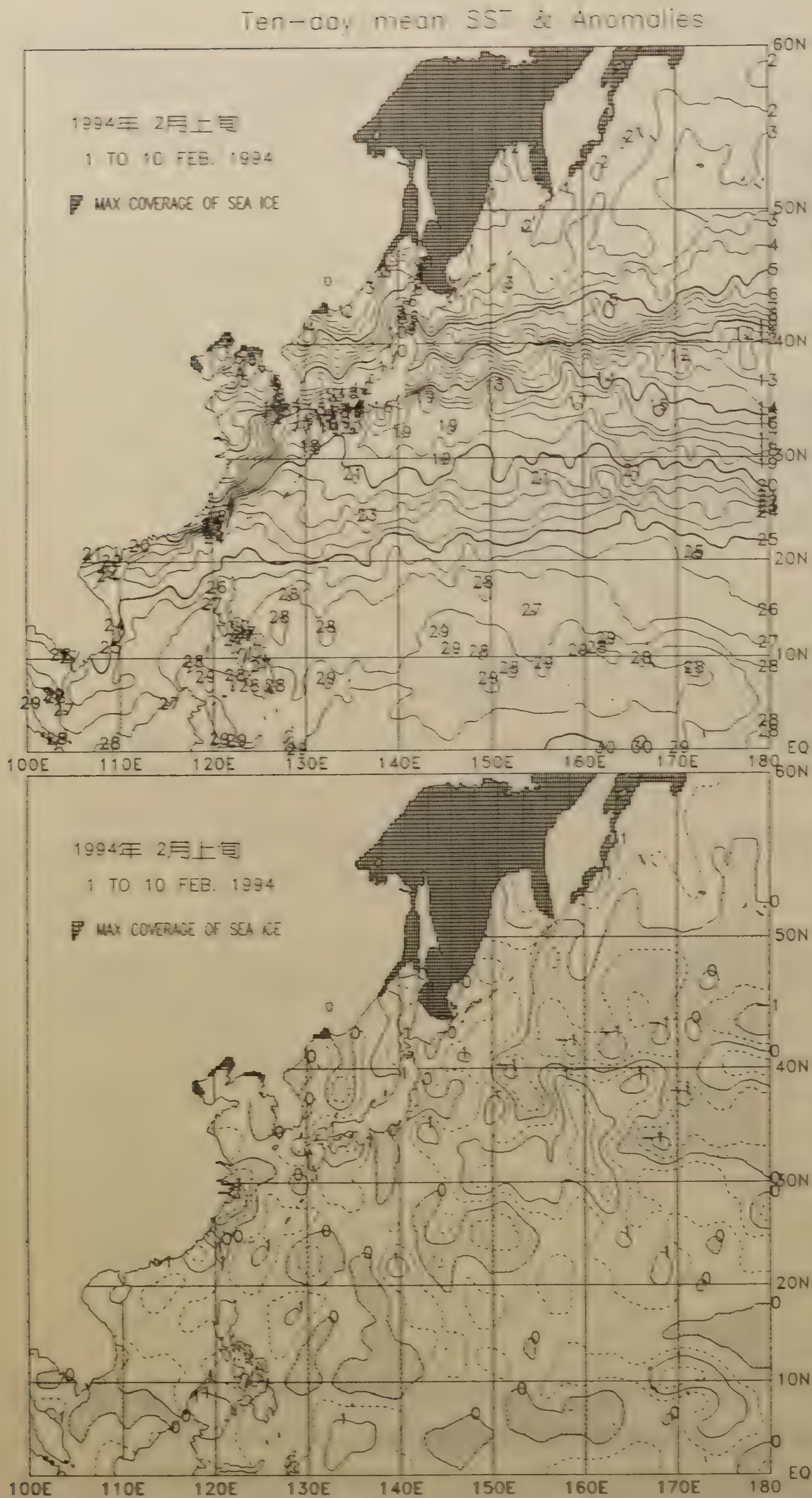
第12図　南方振動指数及び海面気圧偏差時系列図

Fig.12 The Southern Oscillation Index (top) and monthly mean sea level pressure standardized anomalies at Tahiti (middle) and Darwin (bottom). Thin lines show the monthly mean and thick lines their 5 month running mean. Negative values (top, middle) and positive values (bottom) are shaded. Base periods for normals and standard deviations are 1961–1990. This figure is prepared by the Long-range Forecast Division, JMA.



第13図　月平均上層雲量分布図及び偏差図（1994年 2月）

Fig.13 Monthly mean of the high-cloud amount (%, top) and its anomalies (%, bottom) in the equatorial Pacific for FEB 1994. The contour interval is 10%. Areas above 30% are shaded (top) and positive anomalies are stippled (bottom). Anomalies represent a departure from the 1978–1990 base period monthly means. This figure is prepared by the Long-range Forecast Division, JMA.



旬平均沿岸水温(℃)
Coastal Water Temperature

地名 (Index Number)	水温 Temp.	偏差 Anom
石垣島(47918)	22.7	+2.4
那　覇(47936)	21.1	+0.5
名　瀬(47909)	−	−
足摺岬(47898)	16.8	+1.2
潮　岬(47778)	17.9	−
御前崎(47655)	12.5	+2.0
八丈島(47678)	17.1	+0.4
館　山(47672)	16.0	+2.4
小名浜(47598)	10.0	+0.3
宮　古(47585)	7.8	+0.4
浦　河(47426)	0.2	−0.5
紋　別(47435)	−1.3	−
稚　内(47401)	−1.0	−
寿　都(47421)	−	−
江　差(47428)	5.7	−
飛　島(47587)	8.7	−0.1
輪　島(47600)	9.0	+0.9
西　郷(47740)	13.2	−
浜　田(47755)	11.6	−
厳　原(47800)	15.0	−
牛　深(47838)	15.8	−

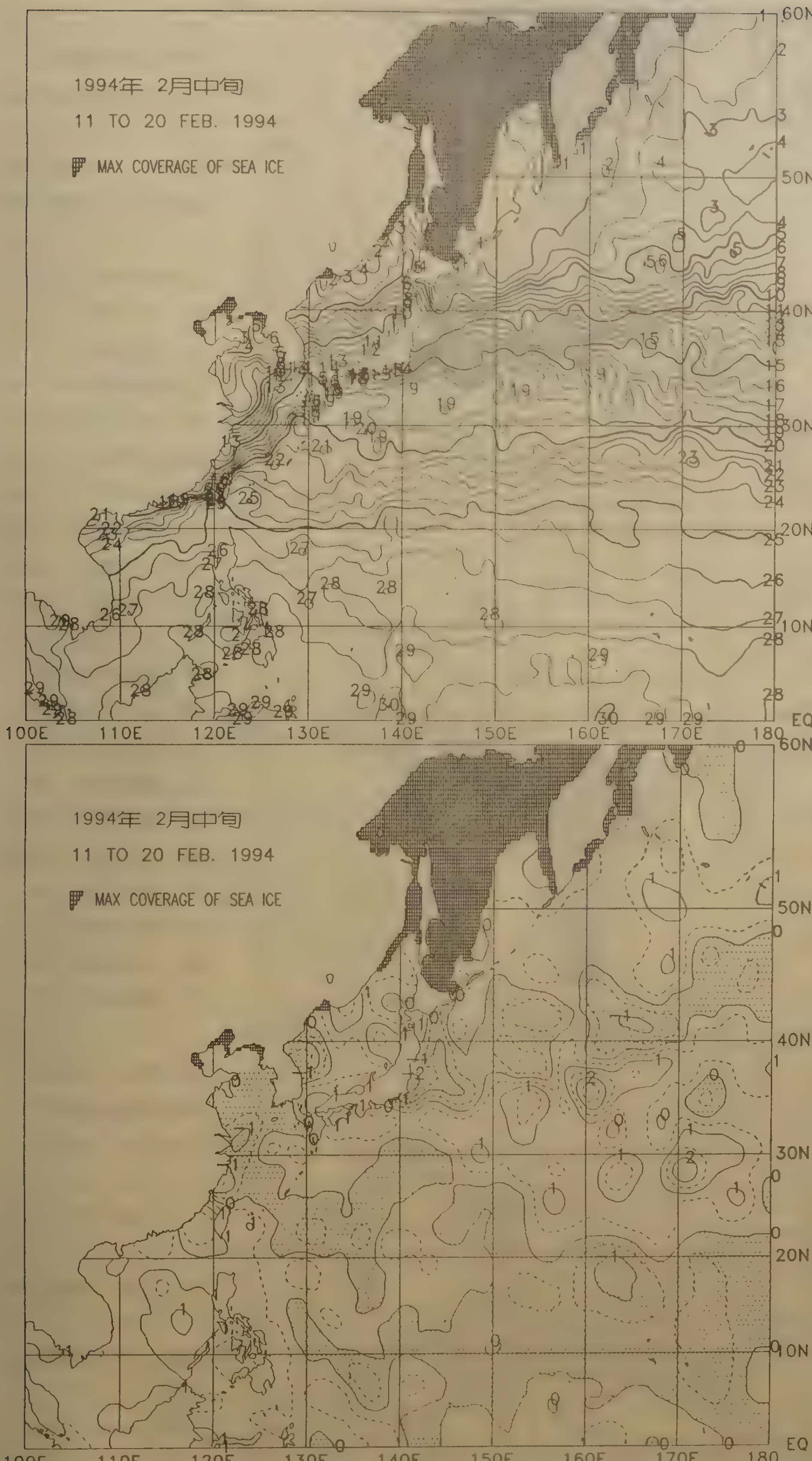
海洋気象ブイロボット
旬平均海面水温(℃)
Ocean Data Buoy SST

地点	位置	水温
日本海	37.9N,134.5E	9.5
四国沖	29.0N,135.0E	20.6
東シナ海	28.2N,126.3E	20.5

第14図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(1994年 2月上旬)

Fig.14 Ten-day mean SSTs in the western North Pacific (top) and anomalies (bottom) for the 1st ten-day period in FEB 1994. Anomalies are computed with respect to the JMA climatology (1961−90). The contour interval is 1° C and additional anomaly contours of 0.5° C are shown. Negative anomalies are stippled.

Ten-day mean SST & Anomalies



旬平均沿岸水温(℃)

Coastal Water Temperature

地名 (Index Number)	水温 Temp.	偏差 Anom
石垣島(47918)	21.9	+1.1
那　覇(47936)	21.2	+0.[illegible]
名　瀬(47909)	-	-
足摺岬(47898)	15.8	+0.2
潮　岬(47778)	17.5	-
御前崎(47655)	11.6	+0.9
八丈島(47678)	17.4	+0.5
館　山(47672)	9.2	+0.7
小名浜(47598)	9.5	-0.1
宮　古(47585)	8.0	+1.2
浦　河(47426)	0.5	-0.2
紋　別(47435)	-	-
稚　内(47401)	-1.2	-
寿　都(47421)	-	-
江　差(47428)	4.1	-
飛　島(47587)	9.2	+0.7
輪　島(47600)	8.3	+0.4
西　郷(47740)	12.7	-
浜　田(47755)	12.2	-
厳　原(47800)	14.6	-
牛　深(47838)	14.9	-

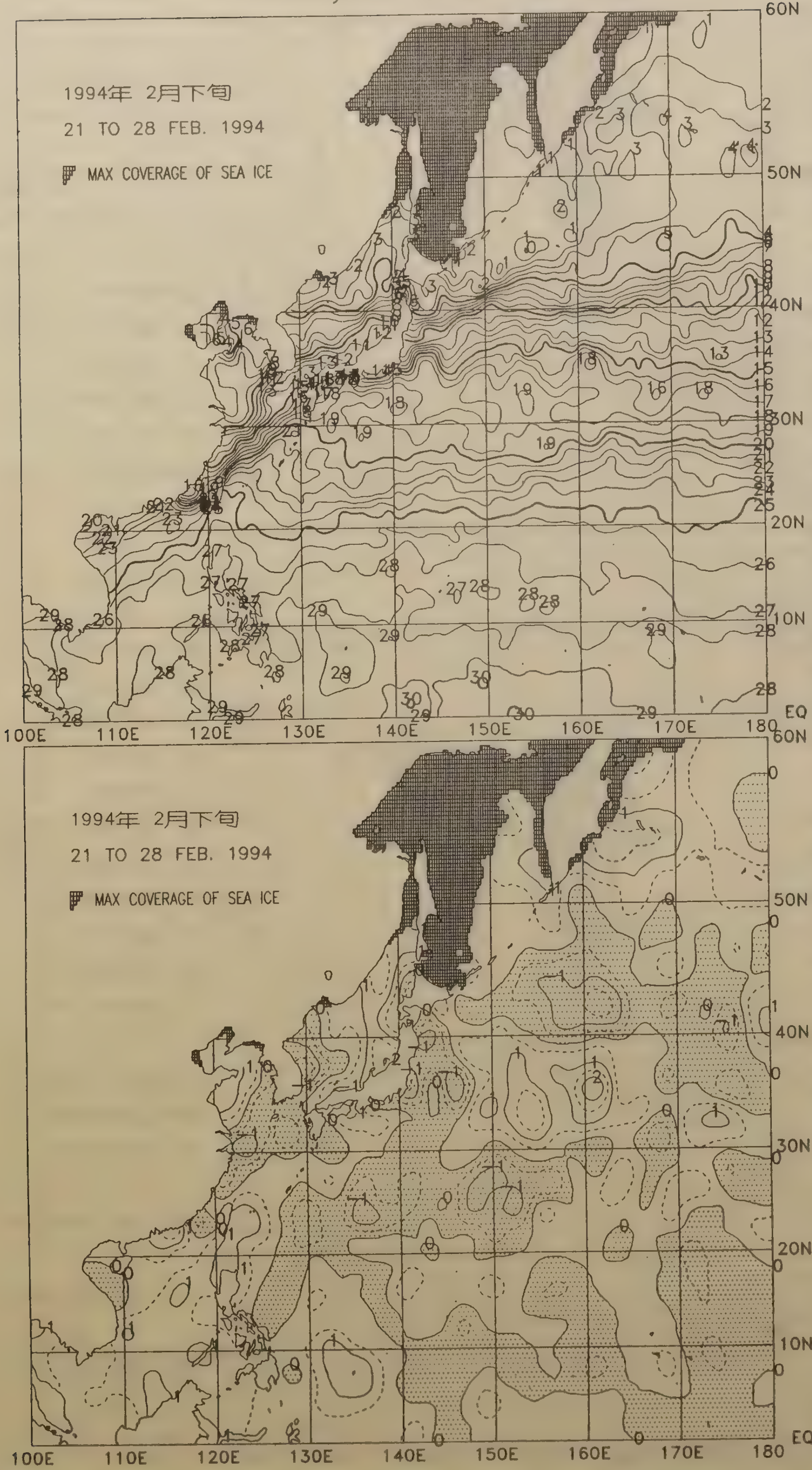
海洋気象ブイロボット
旬平均海面水温(℃)
Ocean Data Buoy SST

日本海 37.9N,134.5E	10.1
四国沖 29.0N,135.0E	20.6
東シナ海 28.2N,126.3E	19.5

第15図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(1994年 2月中旬)

Fig.15 Ten-day mean SSTs in the western North Pacific (top) and anomalies (bottom) for the 2nd ten-day period in FEB 1994. Anomalies are computed with respect to the JMA climatology (1961-90). The contour interval is 1° C and additional anomaly contours of 0.5° C are shown. Negative anomalies are stippled.

Ten-day mean SST & Anomalies



旬平均沿岸水温(℃)
Coastal Water Temperature

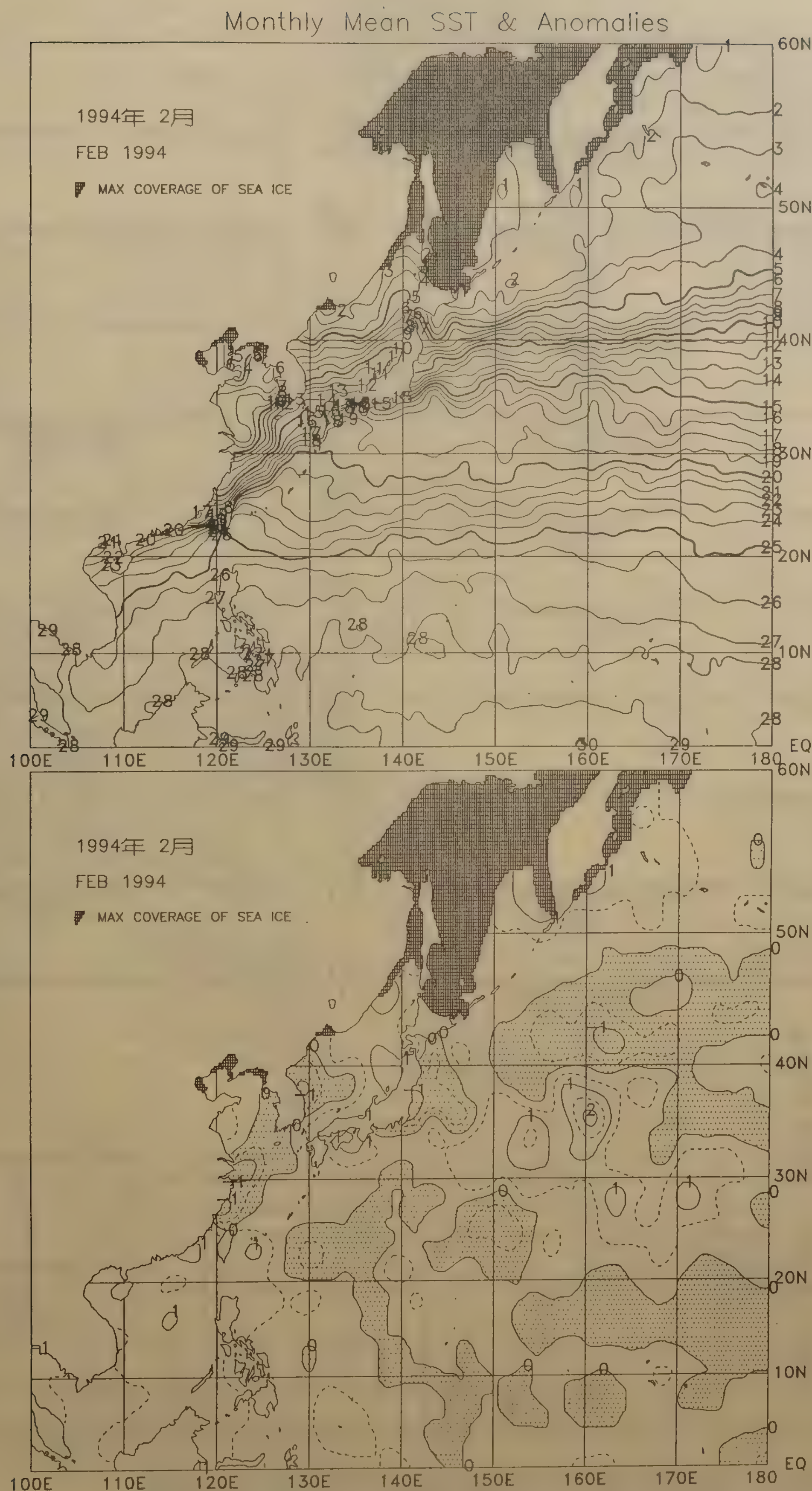
地名 (Index Number)	水温 Temp.	偏差 Anom.
石垣島(47918)	22.4	+1.5
那　覇(47936)	21.1	+0.7
名　瀬(47909)	-	-
足摺岬(47898)	15.7	+0.1
潮　岬(47778)	16.2	-
御前崎(47655)	11.4	+0.4
八丈島(47678)	17.6	+0.8
館　山(47672)	13.6	+0.4
小名浜(47598)	9.0	-0.1
宮　古(47585)	7.6	+1.6
浦　河(47426)	1.8	+1.2
紋　別(47435)	-0.9	-
稚　内(47401)	0.2	-
寿　都(47421)	5.3	-
江　差(47428)	5.6	-
飛　島(47587)	8.8	+0.5
輪　島(47600)	9.3	+1.5
西　郷(47740)	12.4	-
浜　田(47755)	12.3	-
厳　原(47800)	14.4	-
牛　深(47838)	14.7	-

海洋気象ブイロボット
旬平均海面水温(℃)
Ocean Data Buoy SST

日本海	37.9N,134.5E	9.1
四国沖	29.0N,135.0E	20.4
東シナ海	28.2N,126.3E	20.1

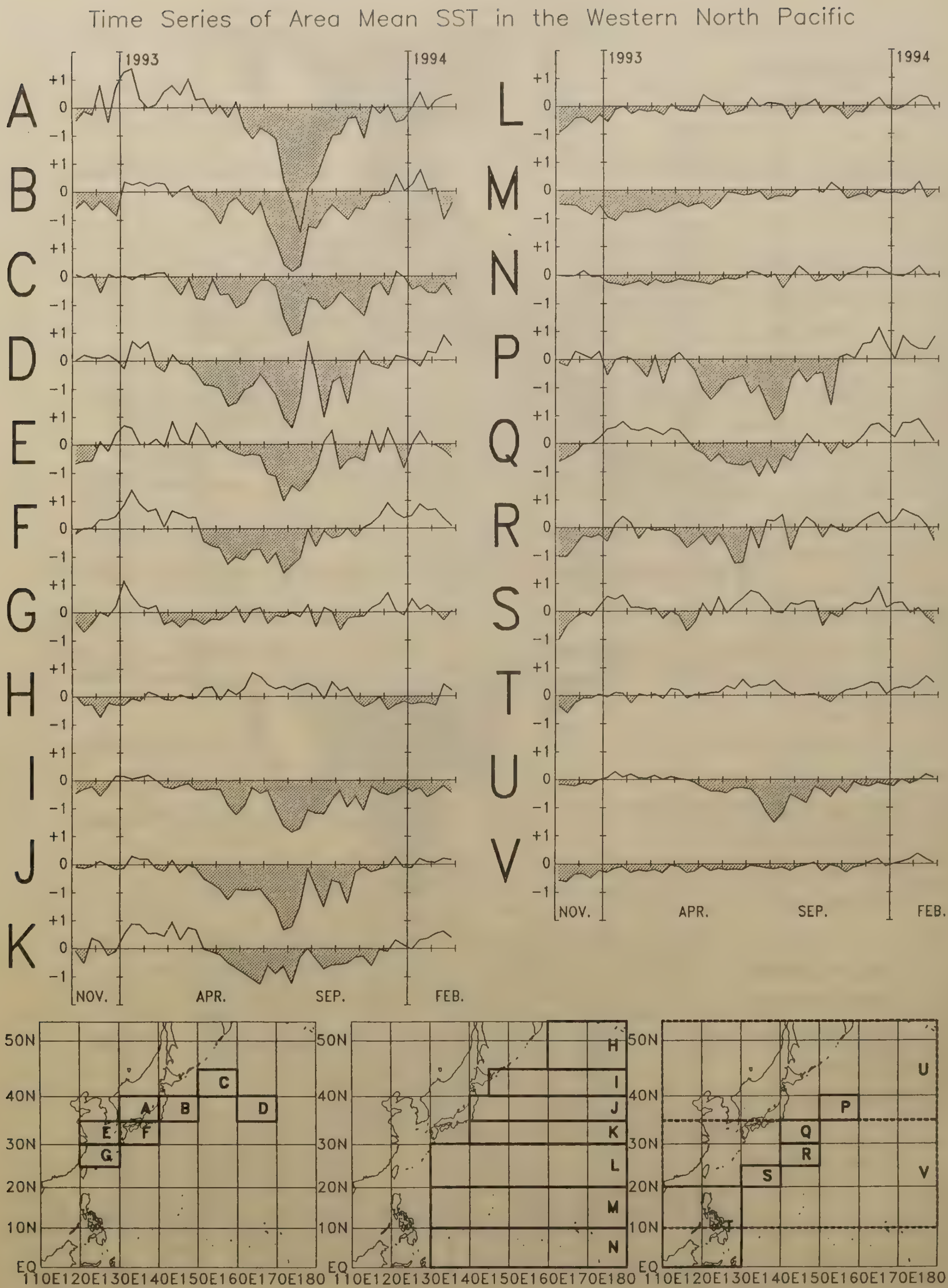
第16図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(1994年 2月下旬)

Fig.16 Ten-day mean SSTs in the western North Pacific (top) and anomalies (bottom) for the 3rd ten-day period in FEB 1994. Anomalies are computed with respect to the JMA climatology (1961-90). The contour interval is 1° C and additional anomaly contours of 0.5° C are shown. Negative anomalies are stippled.



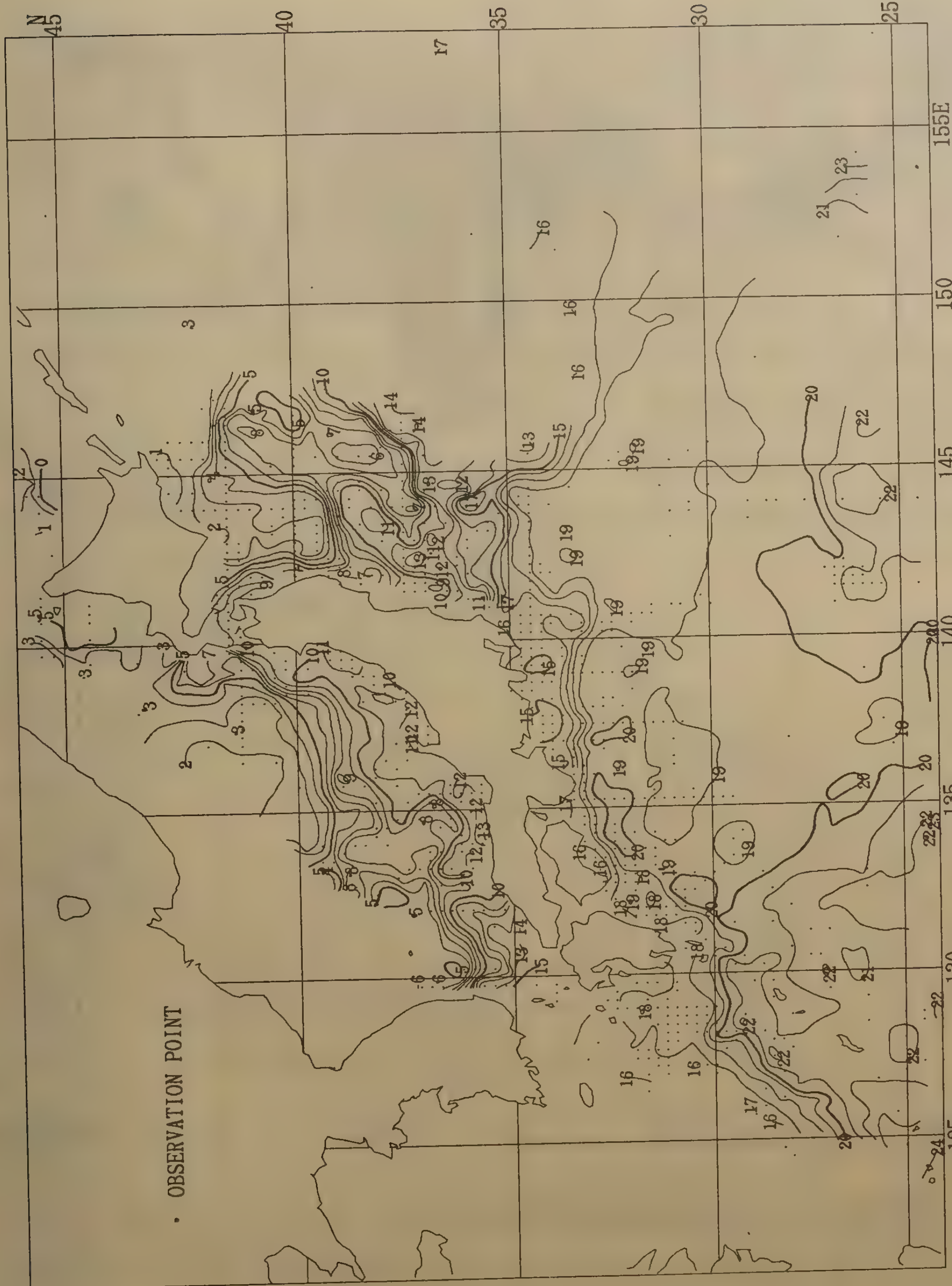
第17図 北西太平洋月平均海面水温図(上)及び偏差図(下)(1994年 2月)

Fig.17 Monthly mean SSTs in the western North Pacific (top) and anomalies (bottom) for FEB 1994. Anomalies are computed with respect to the JMA climatology (1961–90). The contour interval is 1°C and additional anomaly contours of 0.5°C are shown. Negative anomalies are stippled.

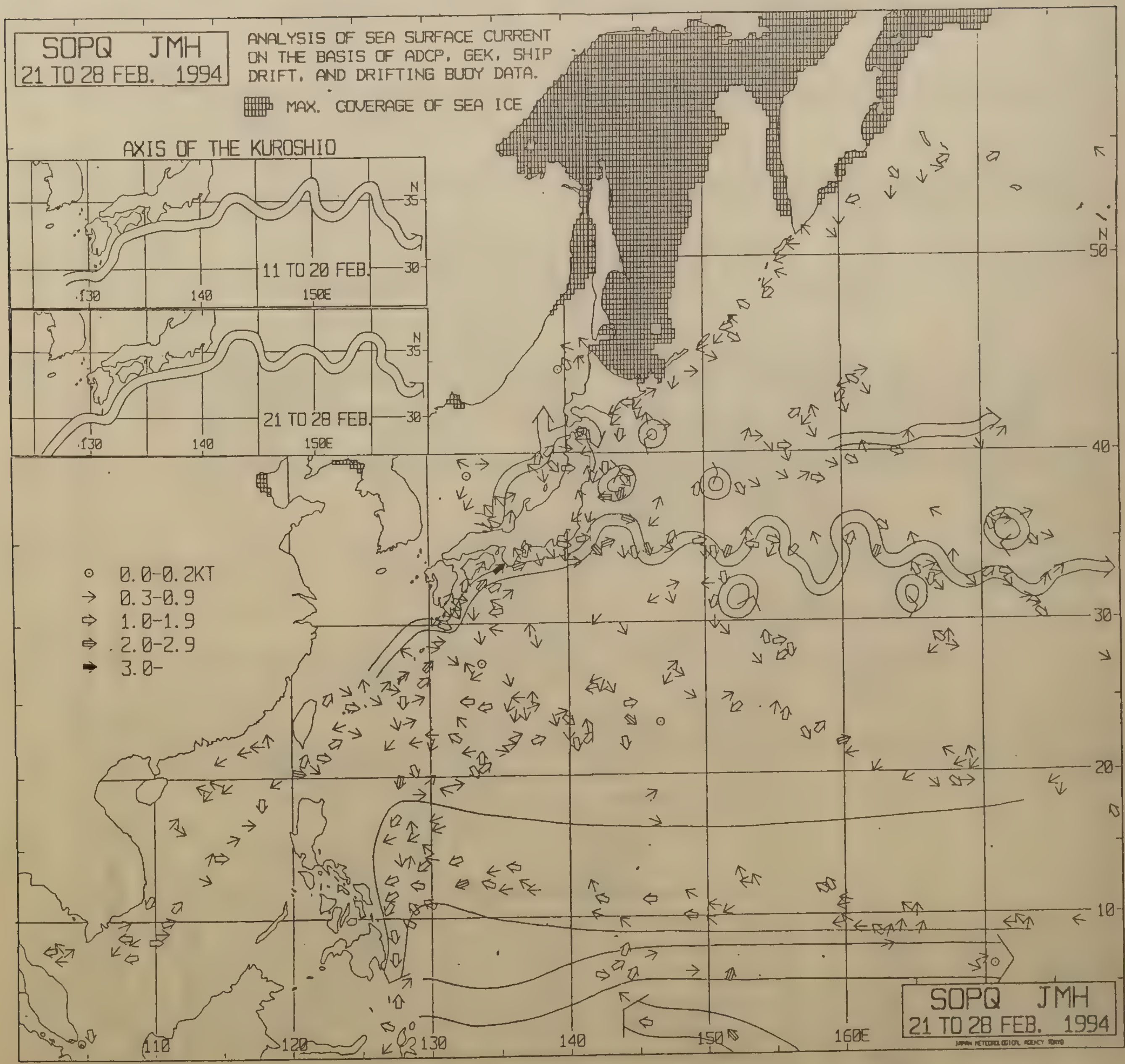


第18図　北西太平洋旬平均海面水温平年偏差時系列図

Fig.18 Time series of the ten-day mean sea surface temperature anomalies (°C) in the western North Pacific for the areas indicated at the bottom. Negative anomalies are shaded. Anomalies are computed with respect to the JMA climatology (1961-90).



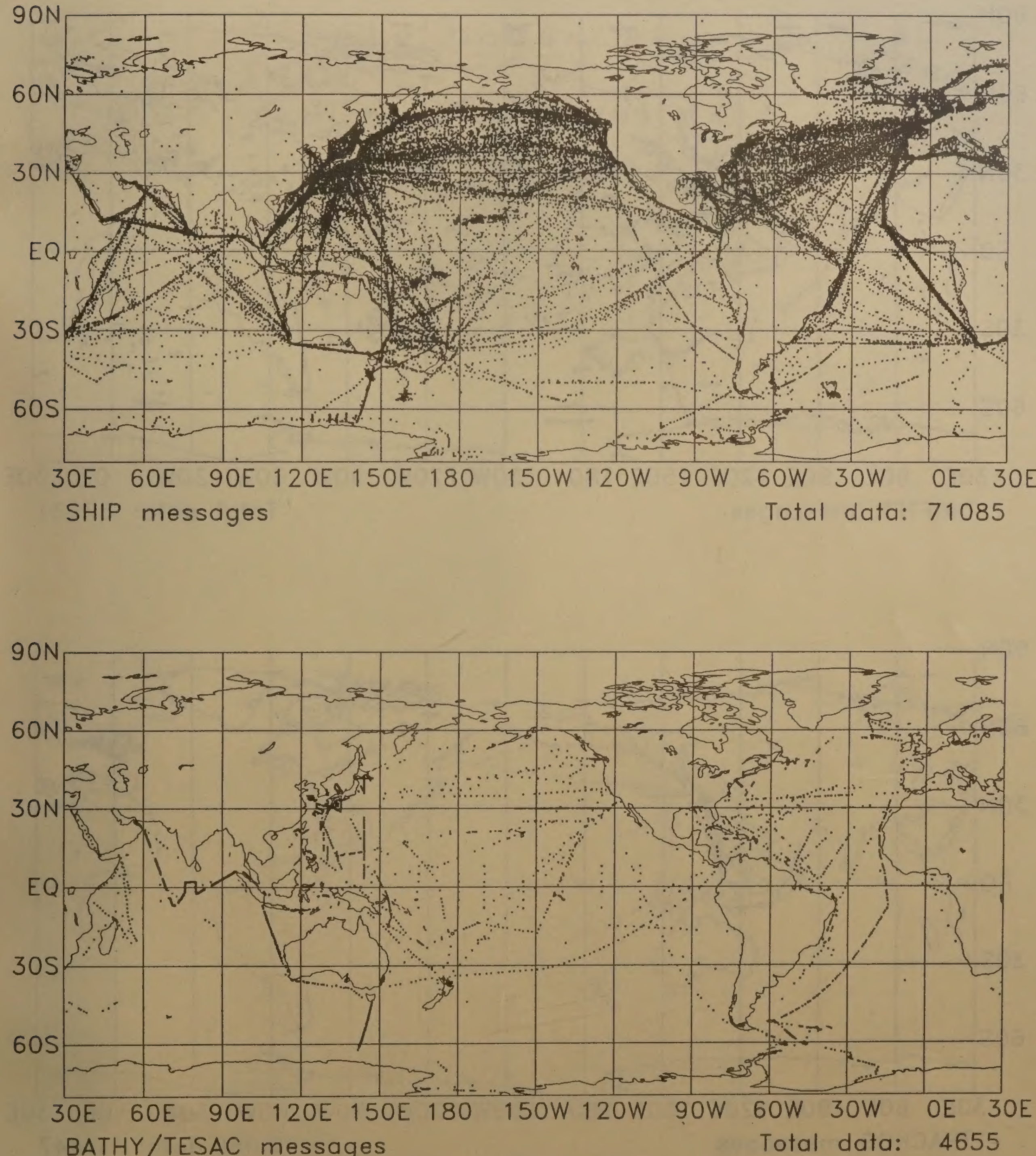
第19図　日本近海表層水温（深さ100M）図（1994年 2月）
Fig.19　Subsurface (100m) temperatures in seas adjacent to Japan for FEB 1994.



第20図　北西太平洋旬平均海流図（1994年 2月下旬）

Fig.20 Ten-day analysis of the sea surface current in the western North Pacific for the 3rd ten-day period in FEB 1994. Small arrows indicate sea surface currents measured with acoustic Doppler current profilers, GEKs deployed in research vessels, and ship drift by merchant ships/drifting buoys during the month. Major currents such as the Kuroshio and the North Equatorial Current are denoted by larger open arrows.

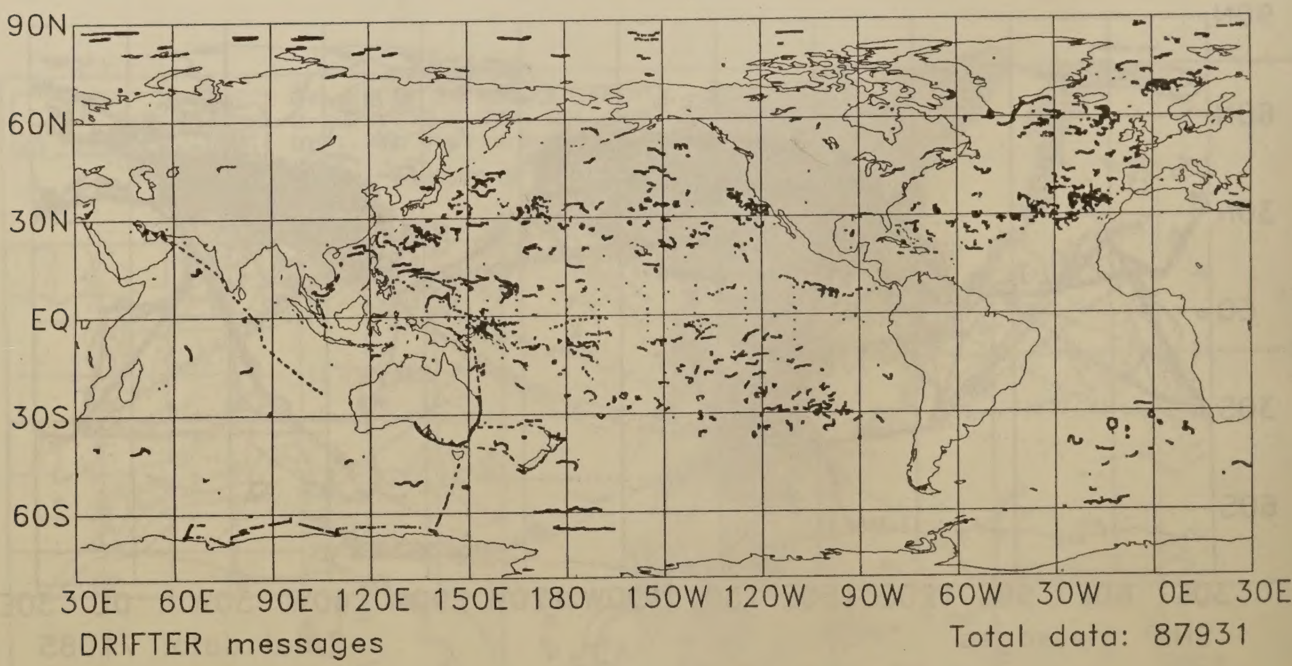
Geographical Distribution of Oceanographic Data

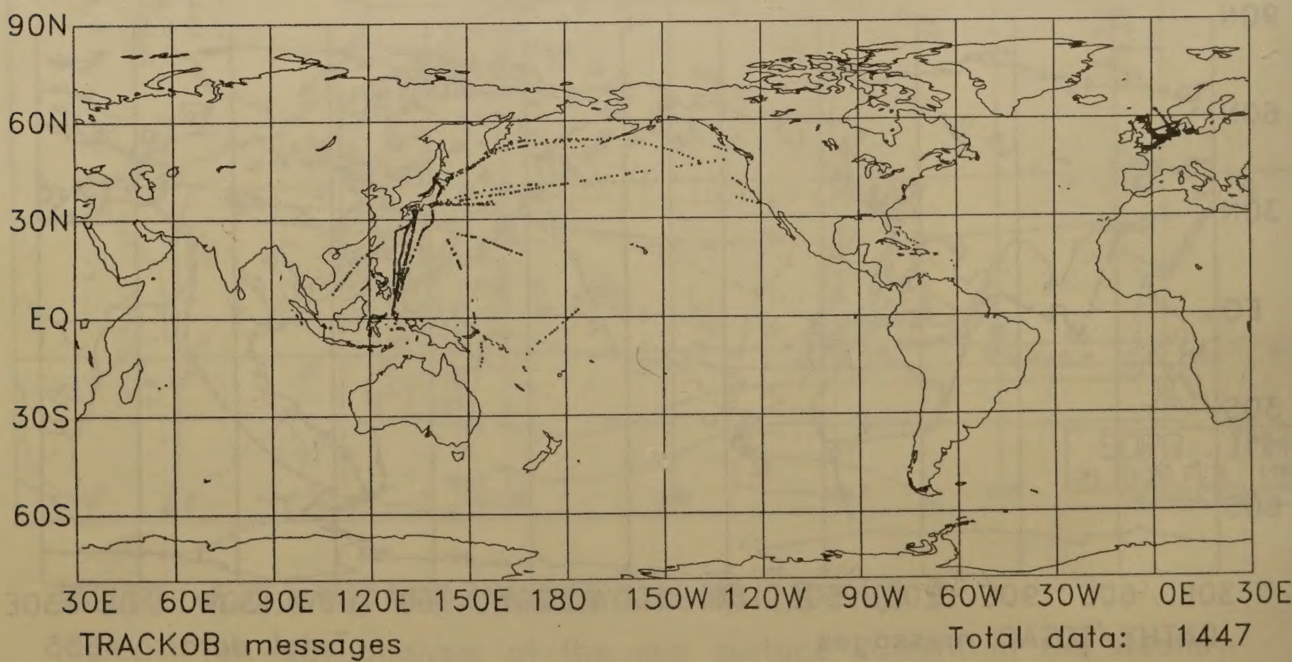


第21-1図　測点分布図(1994年 2月)

Fig.21−1　Geographical distribution of SHIP messages (SST data, top) and BATHY/TESAC messages (subsurface temperature data, bottom) for FEB 1994.

Geographical Distribution of Oceanographic Data





第21-2図　測点分布図(1994年 2月)

Fig.21-2 Geographical distribution of DRIFTER messages (buoy drift and SST data, top) and TRACKOB messages (ship drift and SST data, bottom) for FEB 1994.

気 象 庁 海 洋 月 報

Monthly Ocean Report

February 1994 (No. 14)

平成６年３月１７日発行

編集兼発行所　気　象　庁
東京都千代田区大手町 1-3-4

印刷所　株式会社東京プリント
東京都港区西新橋 3-24-9